



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

THE
ADRIATIC PILOT.



600025526Q





THE
ADRIATIC PILOT.

FROM THE SURVEYS OF
CAMPANA, VISCONTI, AND SMYTH,
AND THE
PORTOLANO OF MARIENI.

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LONDON :
PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY;
AND SOLD BY
J. D. POTTER, *Agent for the Admiralty Charts*,
31 POULTRY, AND 11 KING STREET, TOWER HILL.
1861.

Price 3s. 6d.

201217 J. D. P.



LIST OF WORDS OF FREQUENT OCCURRENCE IN MAPS,
CHARTS, AND SAILING DIRECTIONS.

<i>Italian.</i>	<i>English.</i>	<i>Italian.</i>	<i>English.</i>
Acqua	Water.	Gavitello	Buoy.
Albero	Tree, mast.	Ghiaccio	Ice.
Allerta !.....	Look out !	Ghiaja	Gravel.
Alto, a	High, lofty.	Girante	Revolving.
Ancoraggio	Anchorage.	Golfo	Gulf.
Arena	Sand.	Grande, gran....	Great.
Argilla.....	Clay.	Guado	Ford.
		Guardiano	Health Officer.
Baia	Bay.		
Barra	Bar.	Imboccatura	Mouth of a river.
Bianco, a.....	White.	Isofa.....	Island.
Braccio di 6 piedi	Fathom.	Istmo.....	Isthmus.
Burrasca	Squall.		
		Lago, laguna	Lake, lagoon.
Cala	Cove, creek.	Largo, a.....	Wide, broad.
Campanile	Belfry, tower.	Lume.....	Light.
Canale	Canal, channel.	— fisso.....	Fixed light.
Capo	Cape, headland.	— a folgori...	Flashing light.
Carbone fossile ..	Coal.	— girante....	Revolving light.
Chiesa	Church.	Luna	Moon.
Città	City.	Lungo, a	Long.
Colle	Hill.		
Corpo di guardia.	Guard-house.	Mare	Sea.
Corrente	Current.	Marea	Tide.
Corto, a	Short.	Mercato	Market place.
Costa	Coast, shore.	Molo	Mole, pier, jetty.
		Monte, montagna.	Hill, mountain.
Di dentro.....	Within, inner.	Mulino.....	Mill.
Di fuori	Without, outer.	Muro	Wall.
Dogana	Custom-house.		
		Nero, a	Black.
Erto, a.....	Steep.	Nuovo, a	New.
Fango	Mud.	Palude.....	Marsh, bog.
Faro, fanale....	Lighthouse.	Passo	Pass, channel.
Ferro	Iron.	Piano, a.....	Flat, level, low.
Ferro-via.....	Railroad.	Pianura	Plain.
Fisso, a	Fixed.	Piccolo, a.....	Little, small.
Fiume	River, stream.	Pietra.....	Stone, rock.
Fondo	Deep, bottom.	Piloto.....	Pilot.
Foresta	Forest.	Pioggia	Rain.
Forte, fortezza.	Fort, fortress.	Ponte.....	Bridge.
Fuoco.....	Fire, light.	Porta	Gate of a town.

<i>Italian.</i>	<i>English.</i>	<i>Italian.</i>	<i>English.</i>
Porto	Port, harbour.	Scoglio	Shoal, rock.
Posta delle lettere	Post-office.	Scogliera	Reef of rocks.
Posto	Post, station.	Secca	Shoal, bank.
Promontorio	Promontory.	Segnale	Beacon, signal.
Punta	Point.	Selva	Forest.
		Sorgente	Spring.
Rada	Roadstead.	Stagione	Season, station.
Rio	River, channel.	Strada	Road, street.
Riva	Shore, coast.	Stretto	Strait, narrow.
Rosso, a	Red.		
Sabbia	Sand.	Terra	Land.
Santo, a	Saint, holy.	Torre	Tower.
Sale	Salt.		
Sanità	Health.	Valle	Valley.
Saline	Saltworks.	Vecchio	Old, ancient.
Sasso	Stone.	Villaggio	Village.
Scala	Landing place.	Verde	Green.
Scandaglio	Sounding lead.	Vento	Wind.
		Volcano	Volcano.

La Rosa dei Venti.

Tramontana	North.
Greco tramontana	North-north-east.
Greco	
Greco levante ...	East-north-east.
Levante	East.
Scirocco levante .	East-south-east.
Scirocco	South-east.
Mezzodi scirocco .	South-south-east.
Mezzodi	South.

The Points of the Compass.

Mezzodi	South.
Mezzodi libeccio .	South-south-west.
Libeccio	South-west.
Ponente libeccio .	West-south-west.
Ponente	West.
Ponente maestro .	West-north-west.
Maestro	North-west.
Maestro tramontana	North-north-west.
Tramontana	

ADVERTISEMENT.

THE Adriatic Pilot contains Sailing Directions for the Adriatic Sea, including Corfu and its adjacent islands.

The Directions are founded on the joint surveys of the Austrian, Neapolitan, and English governments, under the direction respectively of Colonels Campana and Visconti, and Captain W. H. Smyth, R. N., between the years 1818 and 1827. They have been compiled by Captain M. S. Nolloth, R.N., from the *Novo Costiere del Mare Adriatico*, by Grubas, 1842; the *Portolano del Mare Adriatico* by Marieni, 1845; a *Memoir*, by Beautemps-Beaupré, in 1808-9, published in 1847; the *Manuel de la Navigation dans la Mer Adriatique*, by Captain Le Gras, of the French Imperial Marine, 1858; and from the journals and remark books of the late Captain Sir William Hoste, R.N., and other officers in Her Majesty's ships up to the present period.

The Variation of the Compass is given at the head of each Chapter, and a Table of Positions is added at the end of the Volume.

I. W.

Hydrographic Office, Admiralty, London,
August 1861.

LIST OF CHARTS AND PLANS REFERRED TO IN THE ADRIATIC PILOT.

Nos.		Scale. Inches.
1,440.	General chart of the Adriatic sea - - -	$m = 0.05$
198.	Italy, East Coast ; Cape Vaticano to Monopoli -	$m = 0.18$
1,499.	Port Otranto - - - -	$m = 2.0$
1,492.	Brindisi harbour - - - -	$m = 2.3$
199.	Italy, East Coast ; Monopoli to Fossaseca -	$m = 0.18$
1,642.	{ Mola, Bari, Molfetta, Bisceglia, Trani -	$m = 3.5$
	{ Barletta, $m = 2.3$; Manfredonia, $m = 2.8$; Viesti	$m = 3.0$
1,500.	Tremiti islands, Pianosa and Pelagosa isles -	$m = 2.4$
200.	Italy, East Coast ; Fossaseca to Rimini -	$m = 0.18$
1,678.	{ Port Ortona, $m = 6.6$; Porto Nuovo, $m = 1.5$; Fano	$m = 3.3$
	{ Sinigaglia, $m = 3.0$; Pisaro, $m = 2.5$; Rimini -	$m = 3.3$
1,880.	Port of Ancona - - - -	$m = 18.0$
201.	Gulf of Venice ; Rimini to Cape Promontore -	$m = 0.2$
1,483.	Venice and Port Chioggia - - - -	$m = 1.4$
1,433.	Port of Trieste - - - -	$m = 6.0$
1,501.	Port Pirano - - - -	$m = 1.7$
1,564.	Ports Quieto and Cittarova - - - -	$m = 1.3$
1,568.	Port Parenzo - - - -	$m = 3.3$
1,566.	Lemo channel - - - -	$m = 1.1$
202.	Fasana and Pola harbours, Brioni islands -	$m = 3.5$
1,558.	Port Veruda - - - -	$m = 2.8$
2,711.	Quarnero gulf ; Cape Promontore to Grossa island -	$m = 0.4$
1,915.	Arsa canal - - - -	$m = 2.5$
1,677.	Porto R�, Port Cherso - - - -	$m = 1.8$
1,561.	Ports Augusto and Cigale in Isola dei Lossini -	$m = 2.4$
1,776.	Port San Pietro, $m = 1.3$; Port Unie -	$m = 2.2$
1,569.	Sette Bocche and Berguglie - - - -	$m = 1.2$
1,677.	Maltempo channel - - - -	$m = 0.5$
203.	Quarnero gulf ; Cape Promontore to Sloselle -	$m = 0.2$
2,774.	Dalmatian islands ; Grossa island to Rogosnizza -	$m = 0.4$
1,565.	Port Tajer in Lunga island - - - -	$m = 1.6$
1,370.	Pasman strait, Zara channel - - - -	$m = 1.9$
204.	Dalmatian islands ; Sloselle to Ragusa Vecchia -	$m = 0.2$
1,560.	Port of Zara, Dalmatia - - - -	$m = 5.2$

VIII

Nos.		Scale. Inches.
1,567.	Morter channel and strait - - - -	$m = 1\cdot9$
1,581.	Port Sebenico, with the outer channels and Vodizze road - - - -	$m = 1\cdot5$
2,712.	Dalmatian islands; Port Rogosnizza to Meleda island	$m = 0\cdot4$
1,622.	Port Rogosnizza - - - -	$m = 1\cdot3$
1,612.	Port Spalatro - - - -	$m = 6\cdot8$
1,614.	Spalatro strait - - - -	$m = 1\cdot9$
1,615.	Lesina channel - - - -	$m = 1\cdot3$
1,618.	Port San Giorgio, Lissa island - - - -	$m = 3\cdot5$
1,649.	Ports Lago and Rosso - - - -	$m = 1\cdot3$
1,611.	Valle Grande bay - - - -	$m = 1\cdot2$
1,616.	Curzola channel - - - -	$m = 0\cdot7$
1,613.	Port Palazzo - - - -	$m = 2\cdot3$
1,582.	Calamota channel, $m = 1\cdot0$; Ports Gravosa, Malfi, Ombla, Ragusa - - - -	$m = 2\cdot5$
205.	Albania; Ragusa Vecchia to Port Palermo - - - -	$m = 0\cdot15$
1,463.	Cattaro gulf, with plan of Port Budua - - - -	$m = 1\cdot0$
1,686.	Antivari bay - - - -	$m = 1\cdot2$
1,588.	Dulcigno road - - - -	$m = 1\cdot7$
1,590.	Durazzo bay - - - -	$m = 0\cdot9$
1,587.	Avlona bay - - - -	$m = 0\cdot6$
1,589.	Port Palermo - - - -	$m = 2\cdot1$
206.	Corfu channels, with coast of Albania, $m = 0\cdot3$;	
	Butrinto bay - - - -	$m = 2\cdot0$
	Port Gayo, $m = 4\cdot0$; Port Laka, $m = 3\cdot5$; Cape Bianco Bank, $m = 1\cdot5$; Alipa and S. Nicolo ports	$m = 3\cdot7$
1,450.	Corfu roadstead - - - -	$m = 2\cdot8$

CONTENTS.

Glossary of Terms of frequent occurrence in Charts, &c.	iii
Advertisement	v
List of Charts and Plans referred to in the Adriatic Pilot	vii

CHAPTER I.

GENERAL DESCRIPTION.

General description of coasts	Page 1-4
Soundings	4, 5
Islands, gulfs	5, 6
Winds, currents, tides	6-14-23
Variation of the Compass	24

CHAPTER II.

NAVIGATION OF THE ADRIATIC.

Making the land	25
Albanian and Dalmatian coasts	27, 28
Islands eastward of Planca point, Curzola, Lagosta, Lissa, &c.	28, 29
Sabbioncello and port Spalatro channels	30, 31
Route to the northward	31, 32
Islands, &c., between Quarnero and Planca point	33
Gulf of Quarnero and Quarnero channel	34, 35
Route to Fiume and to Trieste	35, 36
Venetian coast, Gulf of Manfredonia	37, 38
Route from Venice or Trieste outwards	39

CHAPTER III.

WESTERN COAST.—CAPE ST. MARIA DI LEUCA TO TRONTO RIVER.

Cape St ^a Maria di Leuca; anchorage	41
Ports Castro, Badisco, and Otranto	42, 43
Coast between Otranto and Lecce town	44
Brindisi; port and road	45-47
Coast between Brindisi and Gargono head; anchorages	48
Ports Villanova, Monopoli, Mola, Bari, Molfetta, and Barletta	49-54
Manfredonia; port and road	55
Ports Viesti and Rodi	57
Tremiti islands, Pianosa isle	58, 59
Pelagosa islands, Fortore river	60, 61
Ternoli; anchorage	62
Coast between Vasto and Penna point; Sangro river	63
Pescara; port, river, anchorage	64
Coast between Pescara and Tronto river	65

CHAPTER IV.

Page

WESTERN COAST.—TRONTO RIVER TO PO DI GORO.

Anchorage	-	-	-	-	-	-	-	-	66, 67
Coast between Tronto river and Maestra point; anchorages	-	-							67-69
Porto Nuovo	-	-	-	-	-	-	-	-	69
St. Clemente rocks. Ancona; port and road	-								70-72
Ports Sinigaglia, Fano, Pesaro, Rimini, Cesenatico, Cervia, Ravenna, and Primaro	-	-	-	-	-	-	-	-	73-79
Comacchio lagoon	-	-	-	-	-	-	-	-	79
Port Volano. Goro; road and port	-								80, 81

CHAPTER V.

WESTERN COAST.—MAESTRA POINT TO AUSA RIVER.

Port Gnocca. Pelizza bay	-	-	-	-	-	-	82
Po river. Maestra point	-	-	-	-	-	-	83
Adige and Brenta rivers	-	-	-	-	-	-	84
Venetian coast. Port Chioggia; anchorage	-	-	-	-	-	-	85, 86
Pelestrina island. Port Malamocco	-	-	-	-	-	-	87
Venice. Malamocco island	-	-	-	-	-	-	88, 89
Pelorosso island. Ports Lido and Erasmo	-	-	-	-	-	-	90, 91
Mezza Sacca and Cortellazzo anchorages	-	-	-	-	-	-	92, 93
Grado lagoons. Coast between port Falconera and Tagliamento river	-	-	-	-	-	-	94, 95
Ports Lignano and St. Andrea	-	-	-	-	-	-	95, 96

CHAPTER VI.

EASTERN COAST; AUSA RIVER TO MERLERA POINT.

Ports Buso, Anfora, Grado, Primero, Sdobba, Duino, and Timavo	-	97-99
Port Trieste	-	100
West coast of Istria	-	101
Muja, Grossa point, and Capodistria bays	-	102
Pirano; port and road	-	103
Coast between cape Salvore and port Omago	-	104
Ports Daila, Cittanova, Quietto, Cervera, and Parenzo	-	105-107
Orsera bay. Port Rovigno	-	108, 109
Brioni islands. Pola port and road	-	110-112
Promontore point. Pericolosa shoal	-	113, 114
Gulf of Medolino. Merlera point	-	114, 115

CHAPTER VII.

EASTERN COAST; QUARNERO GULF AND ISLANDS.

East coast of Istria. Ports Cuie and Badò. Arsa canal	-	-	116-118
Ports Marina, Lungo, Rabaz, Fianona and Priluka	-	-	118-119
Fiume; road, rivér. Porto Re	-	-	119-120
Cherso island. Osero and Punta Croce channels	-	-	121, 122
Lossini island. Ports Lossin grande and piccolo	-	-	123, 124

CONTENTS.

xi

	age
Bianca point. Unie island - - - - -	125, 126
Sansego isle. Grand Quarnero channel - - - - -	127
Veglia island. St. Marco islet - - - - -	128-130
Parvicchio and Arbe islands. Barbato channel - - - - -	131
Quarnerolo channel. Premuda islands - - - - -	133
Scarda, Isto, Melada, Selve, Sulbo, and Pago islands - - - - -	134-137
Scardizza, Maon, and Puntadura islands - - - - -	138, 139
Brevilacqua and Pogliana Nuova channels - - - - -	139
Coast of Hungary and Croatia. Maltempo channel - - - - -	140
Ports Segna, Jablanaz, and Carlopago - - - - -	140, 141
Maslinza, and Glinbaz straits - - - - -	141, 142

CHAPTER VIII.

EASTERN COAST.—COAST OF DALMATIA, FROM NEAR LUKOVO TOWN TO PORT ROGOSNIZZA, NEAR PLANCA POINT.

Lunga, or Grossa island - - - - -	143-145
Port Domboch. Luka bay - - - - -	145, 146
Incoronata island. Curvabella islet. Mezzo channel - - - - -	146, 147
Sestrugn, Eso, Ugliano, and Pasman islands - - - - -	148-149
Pasman strait. Zara channel, and port - - - - -	150-152
Morter, Zuri, Kakan, Zlarina and Provicchio islands - - - - -	153-156
Vodizze road. Sebenico channel, and ports - - - - -	156-159
Ports Capo Cesto, Peles, and Rogosnizza - - - - -	159, 160

CHAPTER IX.

EASTERN COAST.—DALMATIA; PLANCA POINT TO MOUNT ULACO, AND ADJACENT ISLANDS.

Planca point. Trau Vecchio bay - - - - -	161
Zirone islands and channel - - - - -	162
Bossiglina bay. Bua island. Saldon bay - - - - -	163, 164
Trau channel. Castelli bay - - - - -	164, 165
Spalatro port, strait and channel. Solta island, and channel - - - - -	166-168
Coast between Xernovizza bay and Macarsca - - - - -	168, 169
Brazza island and channel. Narenta river - - - - -	170-173
Klek and Briesta bays. Lesina island and channel - - - - -	174-177
Canale da greco da Lesina. Torcola island and channel - - - - -	178
Lissa, Busi, and St. Andrea islands. Pomo rock - - - - -	179-182

CHAPTER X.

EASTERN COAST.—DALMATIA : MOUNT VIPERE TO CATTARO.

Cazza, Cazziola, and Marciara islets - - - - -	183, 184
Lagosta island. Lagostini rocks - - - - -	184-186
Curzola island, and channel - - - - -	187-192
Sabbioncello peninsula. Cuciste road - - - - -	192

	Page
For: Tenonici. Lagosta and Meleda channels - - - -	193
Micra island - - - - -	194
Caiumata channel, islands, and anchorages - - - -	195-202
Ragusa; port and road. Breno bay - - - -	203, 204
Porte Molonta Grande and Molonta Piccolo - - - -	205, 206

CHAPTER XI.

EASTERN COAST.—DALMATIA—ALBANIA; OSTRO POINT TO PORT PALERMO.

Gulf of Cattaro - - - - -	207-213
Traste bay - - - - -	213
Budua; port and anchorage. Antivar: bay, and coast to Drino river -	215-217
Cape Rodoni, and coast to Avlona bay - - - -	217-220
Cape Linguetta, and coast to port Palermo - - - -	220, 221

CHAPTER XII.

COAST OF ALBANIA.—CORFU AND ADJACENT ISLANDS.

Quaranta, Butrinto, Gomenizza, and Platania bays - - -	222, 224
Corfu island - - - - -	225-228
Merlera, Fano, Samotraki, Paxo, and Antipaxo islands - - -	228-230
Corfu channels - - - - -	231-234
Table of Positions - - - - -	235-237

IN THIS WORK THE BEARINGS ARE ALL MAGNETIC.

**THE DISTANCES ARE EXPRESSED IN SEA MILES OF
60 TO A DEGREE OF LATITUDE.**

**A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO
100 FATHOMS.**

THE

ADRIATIC PILOT.

CHAPTER I.

GENERAL DESCRIPTION.

THE Adriatic Sea, or Gulf of Venice, is the great expanse of waters, which, branching off to the north-west from the main body of the Mediterranean Sea, is bounded by Italy on the west, and by Austria and Turkey on the east.*

The first of these names is derived from *Adria*, or *Hadria*, founded in 1376 B.C. by an Etruscan colony, and once the most important town in the Adriatic, but now in ruins, some 15 miles inland, at the upper part of the Gulf of Venice; the second name is from Venice, which was for centuries the chief city in the Mediterranean.

The Adriatic, from its southern limit, between Cape Sta. Maria di Leuca and the island of Corfu, to its northern termination at the Venetian shore and Gulf of Trieste, is about 460 miles in length in a general north-west and south-east direction. From Brindisi, in Italy, and Durazzo, in Albania, it lies between two almost parallel coasts, the general breadth being about 90 miles, and the greatest, between Fano and Novi, 110 miles. The narrowest point of entrance is between Capes Otranto and Linguetta, distant only about 37 miles. Within this limit the area of the Adriatic comprises a total of about 40,000 square miles.

The two sides of this sea,† differ entirely in aspect and character, the eastern shore being generally rocky, replete with islands and ports of bold approach, but deficient in inhabitants, provisions, and, in many parts,

* See Admiralty General Chart of the Adriatic Sea, No. 1,440, scale, $d=3\cdot1$ inches.

† Italian seamen frequently make use of the expressions *sotto vento*, leeward, and *sopra vento*, windward, to designate the two coasts of the Adriatic. These terms have reference to the direction in which the *bora*, or north-east wind generally blows; thus, the eastern is the windward, and the western the leeward coast.

in fresh water; the western coast on the contrary is comparatively shallow, and almost without any large ports, yet, excepting some parts of Puglia, populous and abounding in provisions, water, and articles of trade. This peculiarity has so great an influence in the navigation of the sea, that mariners cannot be too careful in making themselves well acquainted with the advantages and inconveniences presented by the two coasts before they decide on their route.

The WESTERN COAST, as it will be termed throughout this work, borders the Adriatic on the south-west, west, north-west, and north; it is the Italian seaboard, beginning on the south-east at Cape Sta. Maria di Leuca, and terminating on the north-west at the river Tagliamento.

It is generally of little elevation, and trends in an almost straight north-west line to Ravenna, where it bends to the north, and forms the Venetian shore. Its uniformity is broken in three principal places; first at Mount Gargano or St. Angelo, near the Tremiti islands; secondly, at Mount Conero, between Loreto and Ancona; and, thirdly, at the delta formed by deposits at the mouth of the Po. The former two, which are high and terminate each in a peak, form excellent land-marks. The celebrated chain of the Apennines, running almost parallel to the Abruzzo sea-line, is situated between these two elevations. The summits of Mount Corno, or Gran Sasso d'Italia, 9,500 feet high, and of Mount Maiella, which are its most elevated points, are remarkable, and may be seen at a great distance in clear weather.

The shore consists chiefly of sandy beaches, and, with the exception of the two points where the land rises, the soundings along it are regular, with an approach of considerably less boldness than on the opposite coast. Roadsteads are scarce; there are many harbours, of which a few only are capable of admitting large vessels, but which are nevertheless suitable to the busy export trade carried on along the thickly populated shore. The most important products exported are corn, rice, fruit, oil, wine, cotton, wool, silk, and salt. The great lakes between Peschichi and Termoli, named Lesina and Varano, have long been celebrated for the abundance, variety, and excellence of their fish; their margins are said to be unhealthy.

A great number of rivers and streams intersect the north-west portion of this coast from the Isonzo to Ancona, and bring down considerable quantities of sand and mud, which line the shore with shallows and obstruct nearly all the harbours. The Italian coast is, however, always easily navigable in fine weather, and can be approached sufficiently near for the recognition of all its most conspicuous objects, which may be generally seen at a distance of 10 to 12 miles.

THE EASTERN COAST borders the Adriatic on the north-east and east, and embraces the Austrian dominions, Istria, Croatia, Dalmatia, Ragusa, and the mouths of the Cattaro, and the Turkish province of Albania as far as Corfu. It is in general high and picturesque, with almost perpendicular cliffs; and very deep water along shore. To these features, however, there is an exception between Cape Linguetta and Drino gulf or bay, where the shore is low and sandy, and the water shoal. This coast runs almost south-east and north-west, and in some places forms deep bays. From Ragusa to Promontore point, it is entirely bordered by islands, rocks, and banks, which render the navigation intricate and often unsafe when overtaken by the bora. Mariners, notwithstanding, give the preference to the eastern coast, particularly during the bad season, as it has some good harbours, and in many parts affords shelter in stress of weather, whilst on the western coast, the only roads are those of Brindisi, Manfredonia, and Ancona, which are often of difficult access.

The depth of water on almost every part of the coasts of Istria, Croatia and Dalmatia, to Drino bay, and between the islands, will enable the largest vessels to approach to within half-a-cable from the land; but the shore should not be closed between Drino bay and Cape Linguetta, as it is foul to some distance seaward.

The greater part of the eastern coast is barren and uninhabited, and the trade is insignificant; with the exception of Trieste, Fiume, and Aulona or Valona, the inhabitants of almost all the towns and islands are very poor, and provisions, including water, are difficult to be obtained.

The basin of the Adriatic is said to be slowly diminishing in size.* There are numerous evidences of encroachment of the land, on the sea, through deposition of soil by rivers. Owing to the peculiar situation of the high mountains of Illyria, the head of the Gulf of Venice receives all the waters flowing from the southern declivities of the Alps and the Carniola mountains, situated between the Po and the Isonzo; here also flow out the Adige, Brenta, Piave, Livenza, Tagliamento, and numerous minor streams, each carrying down in freshes great quantities of alluvium, mud, and gravel, into the lagoons, or vast shallows which border the intervening shore.

The effect of this accumulation is particularly perceptible along the whole coast between Sdokka and Maestra points. Thus Aquileia, which once may have stood near the sea, has long been an inland town, whilst the harbours of Liguentio, Romantino, and Timaro, said by Pliny to have existed on this coast, have entirely disappeared. Adria, which was a station for the Roman fleet, is now 15 miles inland. Another

* Portolano del Mare Adriatico da *Giacomo Marieni*.

town of the name of Spina, formerly bordered by quays, is now completely buried under the sands. Ravenna, built on islands and piles on the margin of the sea, was, in the time of Theodosius the Great, a military port, subject to the influence of the tide ; it is now 9 miles inland, in the midst of gardens and fields. Portus Classis, its ancient harbour, has become a marsh 4 miles from the sea, from which it is separated by the Pineto or pine forest. The flat lands are subject to malaria in summer.*

The colour of the Adriatic Sea, when undisturbed by any accidental or local cause, is darker than that of the Mediterranean, being of a greenish hue. The specific gravity at its mouth was found by Captain Smyth to be 1,0291, at the depth of 40 fathoms.

SOUNDINGS.—In general, throughout this sea, the soundings along shore are according to the exterior character of the coast. Where the land is elevated and rocky, deep water will be found, and vessels may fearlessly approach to a short distance ; where it is low, level, and sandy, the depth is small. The shoalest water is along the Venetian shore and at the mouths of the Po.

The nature of the ground follows an almost uniform rule along the whole of this coast ; fine sand is found near the beach, then sand mixed with mud, and lastly mud ; in some places only, the bottom is clay, covered with soft mud, and sometimes marl intermixed with sand and clay. The distance to which these several zones extend varies according to the strength of the inshore current and its extension seaward. Mud bottom, suitable to anchorage, will almost always be found at a distance of 1 to 3 miles from the land, and the lead brings up mud nearly everywhere towards the middle of the Adriatic.

The researches made at the commencement of the last century, have shown that but little difference exists between the matter of which the nearly horizontal layers of the bed of the Adriatic is composed and that of the surrounding continent, islands, and rocks. A white marble of uniform grain, resembling the substance of the Istrian, Morlaccia, and Dalmatian countries, often occurs : in some places are found gravel, sand, and other matters, more or less metalliferous. Near the beginning

* According to Strabo's account of Adria the encroachment of the sand may be approximately estimated at about 9 miles in 2,000 years.

According to M. de Prony, the sands have advanced 9 miles since 1604 ; in the twelfth century, the sea was from 6 to 7 miles distant from Adria ; at the close of the sixteenth century, when a channel was opened for the river, the most advanced projections of its alluvial deposits were 12 or 13 miles from Adria. This would give a mean annual advance of about 27 yards. The extremities of these alluvial deposits being at present about 22 miles from the meridian of Adria, their annual encroachment may be taken at about 77 yards,

of last century Vitaliano Donati invited attention to the formation of a concretion of crustaceans, testaceans, and polyps partially petrified, and intermixed with earth, which is said to be increasing, and may have the effect, so far, of gradually decreasing the depth.

An extensive bank of mud intermixed with chalky and other matter, which by gradual growth may eventually form an island, has risen in the middle of the Gulf of Venice, where the depths are less than in other parts of the Adriatic.

A depth of 364 fathoms is found in the middle of the entrance, between Capes Linguetta and Otranto. The line of deepest soundings yet obtained runs thence towards Cazza and Pelagosa isles passing about 30 miles south of the islands Meleda and Lagosta. Between Meleda and the mouth of the Adriatic there is no bottom at 514 fathoms. The line of deepest water next passes between Cazza and Pelagosa and takes a north-west direction; around Pomo rock the depth is not more than about 109 fathoms: it then approaches the Dalmatian coast, and passes about 10 miles south of Zuri and Incoronata islands, whence it takes nearly a middle course, bordering on the eastern shore of the sea, to the parallel of Promontore point; at 25 miles to the westward of this the depth is 25 fathoms, gradually decreasing towards the gulf of Trieste.

In the gulf of Venice the depths are generally gradual, and vary between 9 and 25 fathoms. Relatively to the rest of the Adriatic, this part appears to form a submarine plateau, which may strictly be considered a continuation of the great plains of Lombardy and Friuli.

ISLANDS.—Almost all the islands of the Adriatic are situate along the eastern coast between Ragusa and Promontore point. They are very numerous, and appear to have originated in the breaking up of the lower grounds by some violent action, which has left their limestone summits above water. By the salient position of the promontory, terminating in Planca point, they are divided into two distinct groups. The principal islands lying southward of Planca are Meleda, Curzola, Lesina, Brazza, Lissa, and Lagosta; to the northward of the point the most important are Incoronata, Grossa or Lunga, Zuri, Cherso, Veglia, Pago, and Lossini. Their general direction is almost north-west and south-east; they are all narrow in proportion to their length, and form various fine channels called after the nearest adjacent island, and which being bold, with scarcely a hidden danger, give a variety of secure passages between them. The islands are replete with ports and harbours, some of which are of considerable capacity.

Near Gargano head, on the Italian coast, is a group of four islets, called the Tremiti isles, on the south side of which good shelter from

the bora may be found. South of Lissa is the isolated rocky isle of Pelagosa, nearly in the middle of the Adriatic, and between it and the Tremiti isles the low and dangerous Pianosa rock; lastly, to the north-west of Pelagosa, are Pomo, a high pyramidal rock with a dangerous shoal off its north end, and St. Andrea islet.

GULFS.—The most important gulfs of the Adriatic are the following :

The gulf of Trieste, in the most northern part of the sea, extending 20 miles in an east north-east direction, and comprised within the limits of point Tagliamento on the north, and Salvore point in Istria, about 20 miles apart. The depth of water does not reach 15 fathoms. The shallow gulf or bay of Venice, also about 20 miles deep, is bounded by point Tagliamento to the north-east, and point Maestra on the south-west. Like Trieste the depth of water does not exceed 15 fathoms.

The gulf of Quarnero is separated by the peninsula of Istria from the gulf of Trieste; it extends 70 miles from north-west to south-east, and is contained between Promontore point, the land of Nona, and Grossa island. It is in great part occupied by islands, from the four most important of which, Cherso, Veglia, Arbe, and Pago, the gulf is said to derive its name.

The small gulf or harbour of Cattaro, a peculiarly formed basin surrounded by steep cliffs, is on the eastern coast of the Adriatic.

The gulf of Manfredonia, the only one on the Italian coast, south of Gargano head and between that and Trani, is about 17 miles deep from east to west.

WINDS.—The navigation of the Adriatic in a sailing vessel requires care, owing to the liability of being caught without sea-room. The winds demand constant attention, especially during the winter. During summer, they are light and variable, with frequent calms and occasional squalls from the northward; in winter, they are almost always from north or north-east, or from south-east with thick fogs and rain.

The winds are very variable at the mouth of the Adriatic; they are steadier in the middle of the sea; but still more variable at its northern extremity, in the gulf of Venice; it is not unusual to see vessels, near the Po, and Trieste, making good their courses with totally opposite winds.

The weather is exceedingly unstable along the eastern coast, between the gulfs of Trieste and Cattaro; in summer, calms, thunder, water-spouts, and the hot wind, which the Slavonians call *youg*, are frequent, and in winter, heavy northerly blasts of the *bora*, with thick fogs and squalls.

The navigation of the western coast is nearly always hazardous in winter, but during summer it is generally without difficulty, fine weather with alternate land and sea breezes prevailing.

The most frequent winds in the Adriatic are from north-east to east-north-east, and from south-east to south. The former are the most formidable, and constantly require careful attention; the latter, although less dangerous, are troublesome, on account of the sea which they raise and the rain which accompanies them; winds from south-west to north-west blow occasionally, but they are less frequent than those from south-east to north-east, and the duration of westerly to that of easterly winds may be considered as 1 to 3.

Winds from southward, and especially from south-east, are prevalent at the entrance of the sea, whilst those from north-east and north-west, particularly in the fine season, are most common in its northern part; it often happens that fresh breezes from north-east, north-west, and south-west blow in different parts at the same time.

The light breezes are generally from eastward, as in most parts of the Mediterranean; they have the effect of mildewing the sails, if the precaution of airing frequently in westerly and in northerly winds be not taken.

The Bora.—The name *bora* is generally given in the Adriatic to winds between east-north-east and north-north-east. It is very dangerous, and greatly feared, as much for the suddenness of the attack as for its extreme violence; it generally, particularly in winter, blows with the greatest strength after a strong gale from south-east, and is most persistent and violent towards the eastern coast. Its general direction being across the Adriatic, the limited breadth of this sea is certainly one of the causes of the risk attending it, for a vessel unable to keep any longer under sail, is rapidly driven on the coast of Italy, where there is scarcely a good place of shelter for large vessels.*

* The bora will sometimes not allow the use of a single sail, when a vessel cannot escape being thrown on the coast of Italy. Should it admit of any sail being carried, the tacks are so short, that the vessel may get embayed on that coast, without much chance of beating off again.—*Beautems Beaupré*.

In December 1811 the French frigate *Flora*, of 44 guns and 340 men, was surprised by a bora, on her passage from Trieste to Venice, which threw her on the coast near Chiozza, where the captain and two-thirds of her people perished. In 1815 two merchantmen which had anchored off the mole of Trieste, with the intention of entering the following morning, were assailed in the night, and foundered with all hands; and in 1820 the *Monte Cuculi*, a fine Austrian corvette of 20 guns, was met by a bora while under all sail, and instantly went down with the whole of her passengers and crew.—*Smyth's Mediterranean*, p. 256.

The bora is caused by the cold wind in the elevated valleys and mountains rushing down into the warmer basin of the Adriatic. At Trieste it comes down with fury by the pass in the Julian Alps, but its greatest strength rarely reaches beyond 30 miles from the shore.

Vessels generally let fly everything to receive the first blast, then bear up to the southward for any port they can fetch ; or remain under bare poles till it is exhausted.

Off the Gulf of Cattaro the bora, although less violent, sometimes renders it impossible for vessels to carry any sail, even when overtaken at a short distance from land ; very often in this part of the Adriatic, on standing out at once, the wind will be found more moderate, and a vessel may then run for a shelter or keep at sea.

In winter, this wind is to be feared especially in Vrullia bay near Macarsca, at the mouth of the Narenta, and off the valley of Giuliana ; it is also usually exceedingly fierce between Zuri island and Planca point, from the high land in the vicinity of Sebenico.

In the channels of the Quarnero, and at the entrance of this gulf, too great precaution cannot be taken ; the bora here rushes down from the whole line of the Julian Alps with such irresistible fury that it is not only prejudicial to navigation, but extremely so to agriculture, which has in some parts been consequently abandoned ; the chief part of the maritime trade of Fiume can only be carried on during the fine season, and the otherwise eligible haven and arsenal of Porto Re are almost useless. Whole districts are rendered uninhabitable, and as not a bush nor a blade of grass can grow on the shores most exposed, local craft usually anchor off the parts where vegetation is most abundant. When Mount Velebich is capped by white clouds, a vessel should not venture into the Quarnero.

The bora sometimes obliges vessels anchored in Trieste road to seek shelter under Salvore point and along the coast of Istria. It is the more dangerous in the channels because it generally takes vessels on the beam and there is but little room ; the mariner should at all times keep under the weather island, in order to be able to bear up.

It gives sufficient notice of its approach to an attentive observer to allow of precautions being taken. When small dark clouds are seen rising from the mountains of the eastern coast of the Adriatic and taking irregular directions, and large white, round, isolated clouds to alight on the tops of the high mountains of Dalmatia, a bora may be shortly expected, which will continue to blow until the former disappear, and the latter no longer adhere to the land. As a general rule, the clouds only leave the sides of the mountains when the wind loses its force and is about to cease.

The barometer, too, is no safe guide, as although the fall of the mercury does occasionally correspond with the violence of the coming wind, yet it must not be depended upon,—indeed it generally rises during a strong gale from this quarter.

The coming on of the heaviest boras are occasionally announced, some hours before hand, by a dense black cloud on the horizon in the north-east, with light fleecy clouds above it, a rather lurid sky, and an unusual stillness of the atmosphere. The general direction is between north and north-east, and the ordinary continuance about fifteen or twenty hours, with heavy squalls, thunder, lightning, and rain at intervals. The bora most feared is that which after blowing in sudden gusts for three days, subsides, and then returns for three days longer.

It generally dispels any hovering clouds or fog, and when it blows with great force, the weather is very clear; a few small round clouds moving rapidly being alone visible: if the atmosphere should not be cleared-after 24 hours, the wind will probably continue a long time; or a south-easter will spring up. In winter, it is frequently accompanied by thick fogs and snow, causing an excessive coldness.

It usually comes on at the rising or setting of the sun, abating, frequently ceasing, at noon or at daybreak; but should it continue in force at these periods, it may be expected to last a considerable time.

In winter, it is most persistent, sometimes blowing for nine, fifteen, or thirty days, with short intervals of calm, during which it is not prudent to make sail.

In summer, it seldom or never lasts longer than three days, and is then usually moderate; if it increases in strength, it is generally for a short time only, and after a great deal of rain; it has, however, some difficulty in rising as long as the mountains of the eastern coast are very wet with rain; when it then occurs it is of short duration, and the force is generally in proportion to the dryness of the land. March, the end of May, and especially the early part of June, seldom pass without a gale.*

The bora often succeeds a slight rain following a long drought; should it not blow in such a case, south-east winds may be expected.

The Scirocco.—South-east or *scirocco* winds are common throughout the Adriatic; they are usually steady, and only reputed dangerous on account of the thick fogs and heavy sea which, with rain, accompany them; when they occur in winter the land is entirely concealed from view. They are frequently succeeded by a fresh north-west breeze.

The indications are, a very sensible mildness of the atmosphere, even in winter, and dark clouds settling on the summits of the islands and lofty mountains of the eastern coast; these signs occur some time before the wind, which generally passes over the whole sea in gradation.

* For descriptions of hard bora gales experienced in July and August 1819, in Lissa and Lossin Piccolo harbours, see *Smyth's Mediterranean*, pp. 257-259.

A swell from the eastward often precedes this wind ; this, and an increase of rate in the regular current setting to the north-west along the eastern coast, and a rise of the sea above its ordinary level, are sure omens.

The mercury always falls with a south-east wind, and generally with all winds from the southward ; when it continues to fall with the indications described, a south-east wind may be expected to blow with great strength.

If after continuing some time the wind should die away, and be succeeded by a calm or by variables, and the signs above mentioned continue, a renewal may be very soon expected.

It is more frequent in winter than in any other season, generally blowing alternately with the bora ; between the two winds there is nearly always an interval of light variable winds.

It commonly lasts three days, and very seldom beyond nine days in winter. It comes on by degrees, and only blows with violence after 36 or 40 hours : as its direction is right up the Adriatic, the sea gradually increases, the clouds become heavier, rain falls in abundance, and the weather becomes densely foggy, especially in October, November, December, and January.

Vessels may find themselves in peril near, and outside, the islands of the eastern coast should this wind subside immediately after blowing hard and leave a very heavy sea, which often occurs in the evening ; when in this locality, vessels should seek a harbour on observing clouds gathering on the summits of the islands. It is also very dangerous on the eastern coast between Ragusa and Drino bay, and especially off the mouths of Cattaro, which are thereby rendered impracticable during a great part of the year. On the whole of the western coast, and along the Venetian shore, where no shelter whatever is found, the sea breaks heavily.

In summer, the wind from this quarter is never strong, and towards the middle of the Adriatic it generally alternates with light breezes from the east, and sometimes from the north-west. In this season, should the clouds collecting on the summits of the islands, particularly of Lissa, become detached, and rise in thick globular masses, a north-west wind may be expected to succeed.

When south-easterly winds die away in winter, spring, and autumn, they are generally followed at once by those from west, and north-west to north, which bring fine weather.

The Siffanto.— Besides the bora and seirocco, which are the two principal winds in the Adriatic, the south-wester, or *siffanto*, and a southerly wind, prevail occasionally. The danger arising from these

depends on the position of the vessel ; thus in a gale from the south-west no shelter would be found between Cape Linguetta and Ragusa, the whole of that coast being very unsafe ; again, if caught in one of these storms off the islands on the eastern coast, and too far to leeward to make for a harbour or shelter in one of the channels, the vessel would be in difficulty.

The south-west wind is frequently violent, but does not last long ; it sometimes shifts suddenly to the south-east ; these sudden changes are very dangerous in the vicinity of the mouths of the Po, where they always occur in fierce squalls, or *furiani*, with a heavy sea.

A southerly wind is often preceded by the same signs as a south-easterly wind, and it also gives rise to a high sea. Winds from south and south-west are little felt among the islands, which afford protection from them ; and when they are light in the offing, calms are nearly always to be found within the islands. They do not last long, and are generally succeeded by westerly and north-westerly breezes.

The *Maestro*, or north-west wind, is of rather frequent occurrence in the Adriatic, but mostly during the summer, on the western coast, and in the northern part of the sea ; it is always followed by winds from south-eastward.

On the eastern coast it generally rises about mid-day, and drops towards evening, when it is commonly succeeded by land, or by variable, winds which in fine weather sometimes continue after sun-rise.

In the fine season a strong north-west wind occasionally succeeds a south-easter along the western coast ; but it abates at night and during a part of the morning ; at such times light land breezes generally follow.

Winds from north-west, north, and west, do not raise much sea, and they always enable vessels to leave the Adriatic.

LOCAL OBSERVATIONS on the WINDS.—At the entrance of the Adriatic the winds change with the seasons ; being generally from south, south-east, and west, in autumn and winter ; and from north-east and north in spring and summer. The latter may last for some time, but very seldom more than three successive days. Westerly winds, though often blowing hard, with rain, in winter, are not to be dreaded, as good shelter from them can be found. Winds from east and north sweep over the mountains of Epirus, which in winter are covered with snow, causing intense cold ; those from the southward produce a suffocating heat, rendered still more disagreeable by rain and thick fogs.

The entrance of this sea is liable to very sudden gusts, and when it continues to blow hard there the sea is short and confused, subsiding however with the wind.

On the eastern coast, from Drino bay to Quarnero gulf, the bora blows almost constantly in winter with great violence. South-east winds, accompanied by thick fogs and rain, prevail on this coast during the autumn, and render impracticable the mouths of Cattaro and the adjacent shores.

Land breezes of variable strength are common at night on the eastern coast, during the whole year, and at the entrance of many ports continue for a long time after sunrise.

In the neighbourhood of the Narenta, when the clouds, which generally cover the top of Mount Biocovo, rise and break, the bora may confidently be expected with hurricane strength; if these clouds are scattered in the sky, the bora already blows near the land, although it may not have reached the offing. Very intense cold is experienced in winter in this part of the Adriatic on the approach of the bora.

A curious phenomenon, which occurs in the mountains of Montenegro, may be noted here. In the most steady season of the year, in the finest day, and with the purest atmosphere, when not a speck of cloud is perceptible, thunder is heard among the mountains, and it is observed that at these times all the rivulets and springs in the neighbourhood discharge a greater quantity of water than usual.

In the Gulf of Quarnero the bora is the prevailing wind; there, more than at any other part of the eastern coast, it renders navigation truly perilous, and between Promontore point and Unie island it gives rise to formidable whirling gusts and a very heavy sea. It sometimes blows furiously in Morlacca channel, along the Croatian coast, and as far as the middle of the gulf, while there is a dead calm at the islands at its entrance and in the offing. It is easy to know from the appearance of Mount Velebich whether the bora is blowing, or about to blow, in Quarnero gulf; when the summit of its chain of mountains is covered with large, whitish clouds, and small dark clouds are seen to ascend from the gorges, every possible precaution should at once be taken against a gale.

The bora is less violent in summer, when it is called the *borino*; it abates chiefly at the mouths of the channels in the vicinity of the coast of Croatia, where it is followed by a light breeze from eastward, which lasts until about 9 o'clock in the morning; then, after an interval of calm, the wind sets in from north-westward and blows until evening, during nearly the whole of the fine season.

In the Gulf of Quarnero the dark clouds which precede easterly winds alight first on the summit of Mount Osero, then on Maggiore and Velebich mountains, after which they gradually cover the lesser elevations. In the winter the bora and the scirocco sometimes contest violently with each other in the Gulf of Quarnero; caution is therefore

requisite in the navigation of these waters, and with south-easterly winds, even if blowing hard, any signs of the bora must be carefully watched.

The bora is almost constant in winter on the coast of Istria, where it sweeps along the shore. It is almost impracticable in a sailing vessel to take a harbour while it lasts, for on approaching the land it is generally found to blow out of the inlets.

South-east winds in winter become more southerly on meeting Promontore point, but close to the land, along the western coast of Istria, they will be found drawing to the eastward.

South-westerly winds are dangerous on the latter coast, upon which they blow and cause a heavy sea ; although generally of short duration, they obscure the land, when it is difficult to take a harbour.

In summer, when the weather is fine, a light and variable breeze from north-east to east blows almost every morning, nearly throughout the Gulf of Trieste ; it generally draws to the north-west towards noon ; then to the south, and continues till evening. In this gulf two opposite winds sometimes blow at the same time with equal force—the one north of Salvore Cape, the other between Promontore point and Rovigno ; vessels should therefore always approach Salvore with great caution if the sky be not clear in the north-east, which is a sure sign that the bora is blowing in the north part of the gulf.

In winter, on the western coast between Venice and Gargano head, the prevailing winds are the bora and scirocco, which blow alternately ; if they last for any length of time the sea rises and the navigation becomes perilous, particularly near the mouths of the Po.

In summer, on this coast, the winds are light, and generally off the land during the night, and until mid-day ; then from the south or south-east till evening. The sea breeze on the Venetian shore ordinarily comes on feebly and gradually, but sometimes springs up quite suddenly at the head of the gulf, accompanied by thick fogs ; it is then of short duration.

In spring, the winds on this coast are variable ; in autumn they are almost always from south-eastward.

The south-west wind sometimes blows in violent squalls off Mounts Conero and Gargano.

Off the coast between Gargano and Cape Sta. Maria di Leuca, the bora generally blows north and south, except in a very heavy gale : an off-shore wind is frequent at night, while the bora continues in the offing.

From a meteorological journal kept at Venice for five years, it appears that at the head of the Adriatic southerly winds are most frequent during the summer months to September. The wind is seldom from the northward, between April and July, and is generally variable during fifteen days of each month in the year. It is also to be observed, that about twenty days of fine weather, with light breezes or calms, may be depended on in any month of the year.

The rain-gauge shows that 32 inches of rain fell annually, of which 4 inches in September, and $6\frac{1}{2}$ inches in October, January, February, May, and December—periods at which southerly winds are not very frequent in the upper part of the gulf.

The range of the barometer is but small throughout; its indications should, however, be consulted in navigating the Adriatic. The mercury usually rises with winds from the northward, and falls with those from the south or south-east. Bora gales generally produce a momentary depression in the mercury; sometimes this fall is very slight, and far from adequately announcing the coming storm. Mariners should therefore be on their guard when it descends, though but little, especially if the fall be accompanied by the appearances already described as precursors of the bora.

CURRENTS.—A regular north-westerly current sets in from the Corfu channel along the eastern coast, sweeps round the Gulf of Venice, and thence, more rapidly, sets outward along the western coast. It is almost inappreciable beyond a distance of 6 to 10 miles off shore.* This general action is accompanied by a sufficient tidal influence to cause a variety of local sets called *ligazzi*, some of which prevail right across—a natural consequence of the outline of the Adriatic, and the numerous islands.†

The rate of the Adriatic current appears to be very irregular, ‡ varying in calm weather according to locality and season; it is least in summer, when there is scarcely any current on the Venetian and Romagna shores, but along the Pouille shore, it sometimes runs at the rate of 3 knots an hour.

The currents in Corfu channel greatly influence those in the Adriatic. In this channel, and between the Ionian islands, the stream is

* Vessels wishing to avail themselves of this current keep as much as possible within 3 miles of the land.—*Marieni*.

† M. de Freycinet, Lieutenant de Vaisseau, in a remarkable memoir on the currents of the Adriatic, confirms the observations of Marieni, and gives the rate observed by himself on board the *Pluton*.

‡ Vincenzo di Luccio, the Venetian Pilot, in a short treatise on the currents of the Adriatic, published in 1798, describes with great minuteness their velocity and direction at 20 and 30 miles from the western coast, not only for every month in the year, but sometimes for every day in the month.

remarkably affected by the wind, but generally sets to the north, evidently in continuation of the main current of the Mediterranean, which, after running along the shores of Karamania, and through the Archipelago, sweeps round the Morea, and towards the west, past the coasts of France and Spain.

There is sometimes in the Corfu channel a surface run to the southward, which is retarded or increased according to the force and direction of the offing gales. When it blows rather strongly from the north, the waters set to the southward at the rate of $1\frac{1}{2}$ or 2 knots an hour, and a fall of 3 to 4 feet is occasioned. A southerly wind causes a rise to about the same amount, and the current then sets northwards. But this is not confined to the channel, although it is there the most marked, for over the whole Ionian sea, southerly winds cause an extraordinary rise of about a foot, and northerly winds a fall of about the same amount; if they are strong and continuous, the elevation and depression are greater.

While one portion of the general Mediterranean current sets towards the west, past the entrance of the Adriatic, the other flows along the Albanian coast past Cape Linguetta and on each side of Saseno island, in a north-westerly direction, thus forming the general current of the latter sea.

The rate of the stream along this side of the entrance to the Adriatic is commonly about half a knot, increasing perceptibly as Cape Linguetta is approached; and it is generally greater with winds from the southward.

The currents are very variable and frequently strong towards the middle of the entrance, where in fresh northerly breezes they set to west-north-west and west-south-west at three-quarters of a knot to a knot an hour;* along the western coast between Otranto and Cape Sta. Maria di Leuca the current has generally great strength, except in calm weather and during the fine season when the wind blows directly on this coast. The stream at 6 miles in the offing, in a calm, sets about S. by W. at the rate of a knot, and near Cape Sta. Maria at more than 2 knots.† In fresh winds from the north-west, they soon attain a strength of 2, 3, and even 4 knots an hour.‡

The westerly direction of the current at the entrance of the Adriatic may be considered almost constant; sometimes, however, under the influence of winds from west and south-west, along the Ionian islands,

* As a proof of the great variability of the currents here, Marieni says, that "eddies sufficient to make a vessel deviate from her course are frequently met towards the middle of the entrance, over an extent of 10 miles."

† M. de Freycinet.

‡ Of the velocity of the currents near the land in this part of the Adriatic, Marieni says, "they arrest the course of a vessel with a less speed than 3 knots an hour."

and as far as Cape Linguetta, there is a set to the eastward of about a knot, and even more between the islets north-westward of Corfu. H.M.S. *Procris*, in December 1830, experienced here a current running N.N.E. 2 knots in a smooth sea, with a light south-westerly wind.*

Past Saseno island, the main stream appears to divide into two parts, the inshore branch taking a northerly direction as far as the Gulf of Drino, with a very irregular and often scarcely perceptible rate, but which sometimes with south-east winds amounts to 1 and $1\frac{1}{2}$ knots. This current follows rather regularly the coast-line as far as Cape Rodoni. Its greatest velocity is near the headlands, but in the bays it appears to be diffused, and probably causes counter currents. Beyond Cape Rodoni, it flows past the Gulf of Drino, and takes the new direction of the coast.

The course of the other branch from Cape Linguetta is generally in the direction of Meleda island, with a velocity varying in calm weather from half a knot to 2 knots an hour. When influenced by south-westerly winds, and even in calms, this current frequently sets north-eastward, and at about three-quarters of a knot.† Between Cape Linguetta and Meleda, southing in the currents is rarely found, and it is only met on going westward of this line, when it increases as the coast of Italy is approached, especially with a northerly breeze.‡

Off the Gulf of Cattaro, the inshore current of the Albanian coast is deflected by the outset; with south-east winds, which drive the water towards the coast, the opposing streams produce off the Cattaro a constant eddy, which may place in difficulty a vessel here becalmed.

Beyond Cattaro, the general current resumes its course, and off Ragusa, meets the numerous obstacles presented by the islands to the northward, when it sets chiefly to west-north-west and west.

Among the islands, the stream is generally in the direction of their length, or from east to west, and it is more regular in the larger channels, than in the others. The rate varies according to the wind and state of the tide, which latter is considerably felt here and on the coast abreast; with south-easterly winds it sometimes reaches $3\frac{1}{2}$ to 4 knots, especially at the eastern entrances. In the narrow channels, it is more rapid and variable, in consequence of the water within them with difficulty finding its level, at flood and ebb, outside the mouths.

* Remarks by Mr. McDonald, Master H.M.S. *Procris*, 1830.

† The *Psyché*, French frigate, has in a calm here, been carried 30 miles to the N.E. in 24 hours.—*M. de Freycinet*.

‡ In proceeding from Pelagosa to Linguetta, with a north-west breeze, the French steamer *Pluton* found the current setting E.S.E. at the rate of half a knot, and with a fresh breeze from N.N.W. to N.N.E., to the W.S.W. at three-quarters of a knot.—*Ibid*.

In the Narenta channel, the current sets to the west, acquiring great strength in easterly winds, and when the waters of the river are swollen; when these winds fall, the stream is observed to advance along the Sabbioncello peninsula, leaving a counter current favourable to the navigation of the channel along the island of Lesina.

In Meleda channel, with the wind blowing hard from south-east, the current runs west-north-west at the rate of 3 and 4 knots.

In Curzola and Sabbioncello channels, the westerly set is tolerably regular; but south-east winds accelerate it, particularly in the latter, which then becomes almost impracticable to vessels from the westward.

The current in fine weather follows the general direction of Brazza channel. Irregularities are produced by the off-sets of the Narenta and the Cettina, but they are of short duration.

In Solta channel the stream sets round and upon the Zirone islands.

In the small channel of Spalatro, it is very variable in force and direction.

Outside the islands Lagosta, Lissa, &c., there is a regular westerly current, but on closing them it becomes uncertain. Round Lissa, the set is nearly always to the west; with continuous south-easterly winds it has great strength, particularly towards the western part of the island, whence it strikes off to the north-west, and causes an eddy which renders this passage dangerous. The westerly current, in this part of the Adriatic, is accelerated by the outset from the channels of the various islands.

In light winds and calms, the set to the west is at the rate of about three quarters of a knot between Pelagosa and St. Andrea; but with fresh north-west winds its force proportionately decreases.

Near St. Andrea and Pelagosa, the current, particularly in winter, has no regular direction, and produces dangerous eddies; these islands should, therefore, be avoided. After passing Lissa and St. Andrea, it apparently takes its former direction, parallel to the islands and the coast.

Round Planca point, it is always rapid and variable, and in south-east winds violent eddies are produced. From this point, and among all the islands to the north-west, the tide is considerably felt, and contributes greatly to the irregularity.

Between Planca point and Zuri island, the currents resume their regularity and westerly direction, modified only by strong northerly winds and by the flux and reflux of the sea.

The stream runs generally in the direction of the islands between Zuri and the Quarnero; but in the narrow channels, the water is in a

state of constant agitation, and the numerous rocks which lie in them destroy all regularity of flow.

In the four passages between Zuri and Zlarina, and in the vicinity of Sebenico, the set is almost always in an oblique direction, with a velocity frequently of 3 and 4 knots, which demands great attention. Amongst the extensive cluster of islands and rocks south-east of Incoronata, it is rapid.

It runs with great strength at the eastern entrance of Mezzo channel and in the vicinity of Tre Sorelle rocks; it is steady in fine, but very variable in rough weather.

In Pasman strait, it is liable to great irregularity produced by the rocks; strong winds give the stream a motion inclining across the eastern entrance of that channel, when it acquires a rate of 3 to 4 knots.

In the Zara channel only it sets north-westward with some regularity, with a velocity which sometimes reaches 3 and 4 knots an hour.

In Quarnero gulf, and the channels of the Dalmatian coast, the currents are irregular, varying in rate and direction according to wind and tide; they are also influenced by the rivers and numerous islands. Gales from the offing throw a large body of water into the channels, where it is pent up till the wind abates, then flows back with rapidity; if, on the contrary, the winds are from the northward for any length of time, the water is driven into the offing, and as soon as the wind moderates returns with force.

In the Great Quarnero channel, with northerly winds, and during the whole continuance of the flood-tide, a northerly counter-current will be found along Cherso island; in proceeding to Fiume it is therefore preferable to keep along that island instead of the Istrian coast. With the same winds, the southerly current set sometimes attains a rate of 4 knots an hour in Farasina channel, and becomes an almost insurmountable obstacle.

At 10 miles seaward of the islands north of Planca point the general direction is north by west, with a rate decreasing gradually from three-quarters of, to less than half, a knot between Grossa island and Promontore point, but in a strong bora it entirely ceases.

Off Premuda island a branch of the north-west current flows south west towards Ancona, and joins the stream along the Italian coast.

During a heavy bora a stream is sent out of the Great Quarnero channel along the coast of Istria, setting south-west and west-south-west at about a knot; it advances more slowly towards Premuda island, where it takes

a south-west by south direction ; in approaching St. Andrea, it sets south-south-west and south.*

As the parallel of St. Andrea is approached, the influence of the general south-west current is more and more felt.

Well out in the offing, in the vicinity of Pomo, and between the islands Lissa and Premuda, very irregular streams will be found, as it is there the separation of the two principal currents of the Adriatic occurs.

The currents are very variable and strong round Promontore point and among the rocks which surround it. Under the influence of the bora they set to the west and west-north-west with a velocity of more than a knot and their effect is felt as far as Pola. Vigilance must therefore be directed towards this as well as all other projecting points on the eastern coast.

Beyond Promontore point and as far as Trieste, the stream flows slowly along the coast of Istria in ordinary weather ; it is most felt at Auro point, Orsera bank, and Salvore point ; its breadth does not generally exceed 2 or 3 miles. With north-westerly winds there is a strong set on Brioni isles ; the waters accumulated in Fasana channel not finding a sufficient outlet in the narrow south-east pass, escape through the isles, and then join the outer general current.

Between Salvore point and Trieste, the current turns towards the east, and is always felt at the latter place, where it sweeps round the bay on its course to the Venetian shores at the rate of about 1 knot, decreasing in the offing.

In the Gulf of Trieste, in fine weather, the currents are regular ; their ordinary direction being always southerly. At a short distance off the coast of Istria the motion of the waters is in general towards the south-west,† or the Venetian shores, and is tolerably regular in fine weather ; but it is greatly influenced by wind and tide. This irregularity is much more perceptible on the eastern coast than on the western.

During the fine season there is scarcely any current in the middle of the gulf.‡

About midway between Promontore point and Conero, the set varies to between south-south-west and south-east, at a rate generally of only one quarter to half a knot. There is little or no current during the fine season.

* During a calm night a set of 25 to 30 miles out of the channels of these islands has been experienced.

† In a calm, at 4 or 5 miles from the coast of Istria, was found no current, and under similar circumstances, 10 miles in the offing, there was a S.W. by S. set, at one-third of a knot.—*M. de Freycinet*.

‡ In the numerous passages made by the *Pluton* between Trieste and Malamocco, no current was ever experienced — *Ibid*.

The inshore current, from the head of Trieste gulf, always sets very slowly, about west by south, following the various sinuosities of the shores of Venice, Ferrara, and Romagna. It is hardly perceptible in summer calms* and south-west winds; under the influence of the bora it probably reaches a speed of 1 knot an hour.

The tides, which are perceptible on this coast, produce modifications in the direction of the current. At Venice, in particular, the sea flows rapidly into the harbours of the lagoons and into the channels; it then recedes in streams from all directions, which in strong sea-winds give rise to wide and dangerous eddies.

The rivers which pour into the sea between the Tagliamento and Maestra point, have the effect of diverting the current from its usual course; they also bring down quantities of mud and sand, which alter the shape and direction of the banks along the coast, and affect the set of the stream.

The general direction of the current towards the south is never destroyed, however influenced by wind or other causes, and its continuance is proved by the direction and form given to the banks at the entrance of the harbours and the mouths of the rivers.†

A singular effect is observed at the time of the freshes, when the

* The slowness of the current is attributed by Marieni to the opposition of the numerous rivers and torrents of Upper Italy, which, in flowing into the sea, retain for some time a portion of their own velocity; also to the numerous obstacles to the current of the eastern coast before it reaches the parallel of Premuda island, where, as already stated, only a small portion continues its course towards the Venetian shores.

† A proof of the constant south-westerly direction of the currents from the Gulf of Trieste to Maestra point, is the uniform deposition of alluvial matter which has been occurring for ages on the whole sea-board of Lombardy; an effect which could not have been caused by winds or tides. Deep water is found on the coast from Trieste to the mouth of the Isonzo, whilst the shores southward of this, towards the Piave, and at the entrances of the lagoons, are fronted by shoal water over a sandy bottom; even the lagoons have a tendency to fill up, notwithstanding an incessant scour. The islands near Aquileia are covered with alluvium; a large sand-bank lies southward of Grado, and another is being formed in the middle of the gulf. At the mouth of the lagoons, at Malamocco and at Lido, large accumulations of sand are formed in a triangular shape with the apex pointing southward. Between Venice and Trieste are the Isonzo, Tagliamento, Livenza, Piave, and other streams; and it is very evident that the sand and mud brought down by them, are carried southward by a regular and constant current, and obstruct the whole of the Friuli shore. If, on the contrary, the water in this part of the Adriatic flowed at all to the north at the head of the Gulf of Trieste, the port, as well as all those on the eastern coast of Istria, would present the same inconvenience. The roadstead of Trieste is of great antiquity.

Pola likewise is one of the most ancient ports of Istria. Apollonius, of Rhodes, says that a numerous fleet, despatched against the Argonauts to deliver Medea, anchored off the Istrian coast and founded this harbour. Porto Re had ship-building slips in 1728.

strength of the river action overcomes that of the current of this coast. About midway between Malamocco and Parenza, there is a large bank of mud mixed with chalk, resting on solid limestone; it is about 3 miles in breadth, and in length extends to opposite Comacchio. In calms the surface above it appears smooth and nearly stagnant, whilst the current which runs on each side, being weakened by flowing over it, deposits matter in the centre.

The waters of the Po form a delta through which the streams spread out to the eastward, and then bend to the south and south-east; in spring, on the melting of the snow, and after abundant autumnal rains, the action of the freshes is most perceptible.

From Maestra point, the current of the western coast of the Adriatic takes its general direction to the south-east.* As far as Ancona, it is subject only to the deflection caused by the offset from the numerous streams and rivers: its rate is very variable and dependent on the quantity of water those rivers discharge; it is never very considerable on this part of the coast, seldom exceeding 1 knot an hour, after the great freshes of the Po, when the surface of the sea to a distance of 8 or 10 miles in the offing is coloured by the mud brought down.

In the vicinity of Ancona, under Mount Conero, and principally at the southern point of the harbour, the current, deflected by the projection from the mountain, sets to the eastward, frequently at the rate of 1 knot; but if the wind blow long from north-west or north-east, the rate exceeds 2 knots, and the stream may then be dangerous to vessels approaching the land to make Ancona harbour, as it sets on St. Clemente rocks.

In the neighbourhood of Ancona the regular current of the Italian coast acquires its greatest strength; it is here that all the waters of the principal rivers of Italy, and of the numerous Romagna streams, accumulate; and it may be said that more rain falls in the regions comprised between the Apennines, the Alps, and the mountains of Friuli, than in any other equal portion of Europe.

Between Conero and Gargano the current continues its course, following the various bends of the Abruzzo coast; its rate is estimated at 1 knot in fine weather, but it is more rapid close in shore at Mount Gargano, and its deposits form the sandy spits which border Lesina and Verano lakes.

* The constant south-easterly set of the waters along the Italian coast of the Adriatic is demonstrated by the immense deposits formed by the Po, the Adige, the Brenta, &c., which, by their continued accumulation, cause a gradual advance of the shore seaward, and tend to encumber the harbours. Rimini, Fano, Pesaro, Sinigaglia, and Ancona, are filling slowly; Rimini lighthouse is now 2 miles inland.

Gargano Head sends a portion of the current off to the eastward, whilst the other part sweeps round it close along shore, and flows across the mouth of the Gulf of Manfredonia without entering it.*

The branch setting eastward from Cape Gargano flows towards Pianosa and Pelagosa islands, and meeting the western stream already mentioned, produces rapid eddies.

Around and among the Tremiti group the easterly current is of great strength.

From Gargano Head to Otranto the inshore stream, having resumed its south-east direction,† attains its greatest velocity, which is estimated at $1\frac{1}{2}$ knot between Gargano Head and Brindisi, and nearly $1\frac{3}{4}$ knot between the latter and Otranto; in northerly breezes this rate rapidly increases, and sometimes exceeds 3 knots an hour. It is generally weak in summer, especially with on-shore winds, but with those from north-west its strength is sufficient to demand attention.

The waters on passing Cape Otranto follow the trend of the coast southward, and flow close round Cape St^a Maria di Leuca into the Mediterranean.

The off-shore currents on the Italian coast are very variable in their strength and direction, and it is impossible to assign a fixed position to the line dividing the two general and opposite currents of this sea, as it varies according to prevailing winds. The bora winds drive it towards the Italian, and south-west winds towards the Dalmatian coast; whilst south-east winds must render the line of separation irregular on either side. After a strong wind has lasted two or three days, a current contrary to that previously running will always be found, as soon as the wind abates, and will continue until the former has resumed its course.‡

From the great influence of the slightest change of wind on the currents of the Adriatic, it is supposed that they do not extend to any great depth; and according to some observations, the motion of the stream does not

* The harbour of Manfredonia, which dates from 1256, is slowly filling with sand washed up by the sea during south-east gales, but not from the effect of currents.

† The sands carried by the currents, and proceeding from the rivers Candelaro, Ofanto, and Carapella, have formed the ridge of land which borders Salpi lake. Farther south they are slowly filling the harbours of Barletta, Trani, Bari, and Brindisi more than 100 miles distant.

‡ In confirmation of this, M. de Freycinet states:—"On the 1st January, 1850, in sailing down the Adriatic, with a strong breeze from N.E., which shifted to N.W. in a gale, we found ourselves, 24 hours after leaving the vicinity of Pelagosa, off Brindisi, having been set N.W. 24 miles. This could only be attributed to a N.W. current setting against both wind and sea."

reach beyond 4 or 5 fathoms, whilst from others it is considered to extend to a depth of 11 fathoms.*

The **TIDES** of the Adriatic, like those of the Mediterranean, are very slight, and their study has rather a scientific than practical interest, on account of the great irregularities to which they are subject.

Nevertheless, even an approximate knowledge of the rise of tide, and of the time of high and low water, will be of use on the coast between Grado, and Tronto river, where in channel harbours, or ports formed by the mouths of rivers, the passages to which are shallow, a difference in level of even a few inches may be of great practical importance.

It may here be observed, that attention should always be paid to the various causes likely to produce irregularities in the tide of any harbour visited. At the mouths of the rivers, especially of the Po, when the waters are swollen by rains or the melting of snow, the rapid outset necessarily retards the flood, and accelerates the ebb. The land should therefore be approached with caution at such times, and mariners will do well to take the advice of local pilots, who are best acquainted with the nature and effect of the tides.

The tidal action is scarcely perceptible at the mouth of the Adriatic; it is first felt at Cattaro on the eastern, and at Brindisi on the western coast, becoming stronger towards the northern part of the gulf.

On the shores of Dalmatia the tides are very weak and irregular; but as there is deep water on every part of this coast and in all its harbours, the state of the tide on entering port is of little consequence.

Observations made here show a slight range of tide in calm weather, but none with fresh north-west winds.

In strong south-east winds there is sometimes a rise of one foot to nearly 2 feet; and in the channels, and the narrow passages between the islands, a rapid tidal stream of short duration is produced.

Captain, now Admiral, W. H. Smyth, in H.M.S. *Aid*, found the tide stream off the coast of Istria to set against the north-east wind at the rate of nearly a knot an hour, and then return to its south-east course; and at times the effect of the ebb stream was to cause an apparent stand-still of the offing and central waters.

On the western coast the rise varies from one foot to nearly 4 feet in springs, according to local circumstances, and prevailing winds.

Bora gales occasion a rising along the coast of Italy; at Barletta, Bari, Monopoli, and Brindisi, mariners report a tidal action ranging from a few inches to 3 feet.

* Marieni.

At Venice, the sea, in a heavy gale from south-east, sometimes rises 6 feet above the general level,* but this great elevation of the waters is of no service to navigation, for these gales render the lagoons unapproachable and the channels unsafe; northerly winds cause a fall sufficient to uncover the mud of the lagoons.

A mean of five years' observations at Venice, according to Professor Toaldo, gives a rise and fall of 2 feet at spring tides; also the approximate establishments of the ports of Malamocco and Chioggia 10 h. 30 m., and of that of the port of Venice 11 h. 15 m.

The height of the springs at Venice is supposed to exceed that of ancient times, because the tides now flow to places considerably more elevated than those which they then reached; but the instances given are very doubtful; exact registers have never been kept; and it must be remembered that tide-mills were established at Venice as early as the year A.D. 1078.†

VARIATION OF THE COMPASS.—The general direction of the lines of equal variation in the Adriatic—as in most parts of the Mediterranean sea—is nearly north and south (*true*); ranging in amount at the present time from 14° W., at its north-western part, to $10\frac{1}{2}^{\circ}$ W. at its south-eastern.

The annual decrease is about $6'$, and this rate appears to have been nearly preserved during the last forty years; for we find from the observations of Captain W. H. Smyth, R.N. (now Vice-Admiral), that in 1819 at Venice it was $17^{\circ} 10'$ W., at Trieste $16^{\circ} 54'$ W., and at Corfu $14^{\circ} 33'$ W.; these places having in 1861 respectively 14° , $13^{\circ} 28'$, and $10^{\circ} 30'$. In the employment, therefore, of charts of an early date the mariner is cautioned of these striking changes.

* Toward the end of December 1821, after a continuance of fresh south-east winds for several days, the sea was raised to an extraordinary height; so much so, that Venice appeared like an extensive lake during the whole of Christmas day and the 26th. On this occasion the gondolas were plying in the Piazza di San Marco; and from the evidence of records and votive pictures, this is not at all a solitary case.—*Smyth's Mediterranean*, p. 183.

This phenomenon had never before been witnessed, except at the time of full moon.—*Baron de Zach*.

† An elevation of the sea-level, estimated at about 4 inches in a century, and which is probably attributable to the silting up of the channels, has been determined at Venice.—*M. de Freycinet*.

CHAPTER II.

NAVIGATION OF THE ADRIATIC.

THE navigation of the Adriatic Sea, like other narrow seas, requires thorough experience. The difficulties arise from the frequency in winter of thick fogs and boisterous winds, from the narrowness of the sea, and from the want of trusty places of refuge from bad weather on the leeward shores.

It should be considered a general rule that the eastern side is to be preferred, both in passing up and in quitting the Adriatic, notwithstanding the disadvantage of adverse currents, when proceeding to the southward along this shore. Under very favourable circumstances, and in the summer season, well-conditioned vessels may, on sailing southward, venture to the westward.

On the western side, a sailing vessel can seldom reckon upon reaching shelter from a sudden gale, and great risk would be incurred if surprised by bad weather in the vicinity of the shore; whereas on the opposite shore there are nearly everywhere good ports, or places of shelter, especially from the bora.

A sailing-vessel should use the greatest possible vigilance, to avoid being caught unprepared in a bora, which is a most formidable wind, particularly when encountered in the open sea. At the slightest premonitory symptoms of it no time should be lost in seeking the nearest place of refuge, as the violence of the gale may drive her speedily to the westward, and reduce her to the necessity of endeavouring to ride it out at anchor on an open coast, with bad holding-ground. The anchorage under Gargano head would afford shelter to a vessel so overtaken if she could weather Cape Viesti; failing this, she might make for that of Tremiti islands.

The navigator should be also on his guard against the scirocco, or south-east wind, which, when violent, is dangerous in some parts of the Adriatic; but as it generally gives ample warning, and invariably comes on to blow gradually, there is ordinarily sufficient time to secure shelter under the islands.

MAKING THE LAND.—It is customary for vessels bound to the Adriatic from the Mediterranean, to endeavour to make Corfu island,

which, being elevated, is visible at a considerable distance. Approaching from westward, the coasts of Epirus are first seen, and then Corfu and its islands, forming a long chain of small regular hills. The monastery crowning Mount Salvatore, on the north side of Corfu, forms a good mark. The island may be boldly approached, and a course steered westward of Fano island, in order to close Cape Linguetta, the extremity of the eastern coast of the Adriatic Sea.

Sometimes vessels make Cape St^a Maria di Leuca, but occasionally the land-fall is more to the westward, on the Italian coast. Cape Sta. Maria is easily recognized, being high (520 feet), and jutting out south-eastward: when viewed from southward, it presents a steep rocky face, precipitous at the edge of the sea; from south-westward and westward it is seen to terminate seaward, in a slope of about 45°; when approached from south-westward and eastward, the declivity appears more gradual. On its summit are a chapel and a white column; also several large houses, which open well out from each other.

In making the land with south-easterly winds, which usually bring thick weather, it is difficult to distinguish the coast of Italy even at a very short distance; and it is then better not to make the land much to the westward of Cape St^a Maria, as at a mile westward from Ristola point a dry bank extends seaward about one mile. If the Italian shore should be made, prompt endeavour should be used to close Cape Linguetta and the Albanian coast, especially in the bad season.

The chances of favourable or unfavourable winds on entering the Adriatic will be according to the time of year: thus in the autumn and winter, southerly, south-easterly, and easterly winds prevail; in the summer, the most common winds are north-easterly and northerly: the latter last a considerable time, but never with strength for more than 3 days.

On making the land with fair winds, viz., winds between south-east and south-west, a course should be steered to pass about 12 miles from Cape Otranto. In the winter, with strong winds, a heavy sea and rain are almost continuous at the north of the Adriatic; nevertheless there should be no hesitation in proceeding after having verified the vessel's position, as shelter may be easily found if it should become necessary.

With contrary winds, the Albanian coast should be closed, to take advantage of the weatherly current, which, setting to the north-west, is favourable as far as Cape Linguetta. The Italian coast between Capes St^a Maria di Leuca and Otranto should be avoided as much as possible, for in northerly winds the south-easterly current is always very rapid.

In the fine season, north-westerly winds often blow rather fresh during the day at the mouth of the Adriatic, and vessels, if unable to beat

against the current which constantly sets out near the middle of the entrance, proceed to the anchorage of Castro Bay. With a violent bora, as it is not then prudent to attempt to enter the Adriatic, the anchor should be dropped under Cape St^a Maria till the gale is over.

The ALBANIAN COAST, between Corfu and Cape Linguetta, along which a vessel should work up against contrary winds, is high and bold, offering no shelter or good anchoring ground ; therefore, it should not be closed with winds which make it a dead lee-shore, although the current would probably be favourable.

When proceeding to Drino, Cattaro, Ragusa, &c., no remarkable point presents itself along the generally low, sandy coast of Albania beyond Cape Linguetta, excepting Cape Laghi ; care should therefore be taken to keep well clear of the land. During the first part of the course, the current will be found setting north-westward, at about one mile a hour, and north-eastward when about abreast of Durazzo.

If overtaken by a heavy gale from the southward or south-west, which would be sometimes attended with danger on this part of the eastern coast, shelter may be sought in Aulona, or in Durazzo, bay. The first of these is the easier of access under all circumstances ; it would sometimes be imprudent in a southerly gale to make Durazzo bay, as the adjoining land is low, and not easily distinguished in obscure weather, and after recognizing the bay it would be difficult to make out the sea-marks, without the guidance of which it would be impracticable to proceed between the shoals to the anchorage. If unable to fetch Aulona, it would be advisable to make for the Gulf of Drino, where good shelter would be found near Cape Rodoni.

Between the above-mentioned bays there is not a single place of refuge ; if driven towards the shore by stress of weather, the lead should be kept constantly in use, and the anchor dropped immediately on obtaining the depth of at least 11 fathoms. If Antivari bay can be reached, shelter may be found on the north side of the point, which forms its south extreme.

The winds chiefly to be apprehended between Cape Linguetta and Cattaro are the bora, which blows from between N.E. and E.N.E. ; south-west winds, which are right on the shore ; and, with reference to making the land, south-east winds, which are usually accompanied with thick weather.

If when between Cape Linguetta and Cattaro, warnings of the approach of a bora gale should be perceived, a vessel, if sufficiently far north-eastward, should haul close to the wind on the port tack, and seek shelter under the Albanian coast, in the great bay between Antivari and Cape Dulcigno, or along the shore between the latter and St. Giovanni di Medua,

or, finally between Cape Rodoni and St. Stefano river. In the north, and sufficiently near the shore, with the bora not too violent, a vessel of light draught, might, by promptly standing upon the starboard tack, reach shelter in Molonta or in Trieste bay, or if of considerable draught, in Calamota channel. But it should be recollected that all these places become difficult to reach as soon as this wind blows with more than moderate strength. Lastly, if a vessel should find herself too far southward to reach one of the above places, she should endeavour to fetch the anchorage at Meleda, to avoid the necessity of running to leeward.

The DALMATIAN COAST.—In all cases great caution must be used in navigating the coast, in consequence of the distance to which shoal water extends from it, especially off the mouths of rivers, where sand-banks are often not only extensive, but very changeful, particularly after heavy rains.

Cattaro.—On approaching high lands of the gulf the bora sometimes reaches the vessel with such violence, and raises so heavy a sea, that attempts to fetch port would be fruitless, and the most prudent measure is to scud under bare poles for shelter in the Gulf of Manfredonia, or to endeavour to quit the Adriatic, and proceed to the anchorage of St. Maria di Leuca.

Sometimes, when driven from under the land by the violence of the bora, the wind will be found moderate at the distance of 10 miles from it, but even then it would be advisable to seek shelter elsewhere, as there would be no probability of making out the land.

Ragusa.—The land should not be closed early in the day with south-easterly winds, as morning calms, and current eddies, would probably render the vessel unmanageable. It must be recollected that Ragusa is not a safe anchorage in a strong south-easter.

Breno Bay, northward of Ragusa Vecchia, affords good shelter in south-easterly winds, and is a good refuge when wind-bound on the coast.

Calamota Channel.—The direction given with regard to approaching Ragusa, is applicable to vessels entering the channel from the eastward: indeed, it would be advantageous to make Ragusa first, as the currents set to the westward along the land. When arriving from the eastward the easiest and most frequently used passage is between Pettini rocks and Calamota island.

ISLANDS, &c. Eastward of PLANCA POINT.—The channels formed by this group are, generally, tolerably wide, and less obstructed by rocks and shoals than those formed by the islands westward of Planca point. The currents are regular in ordinary weather, and the navigation

is not difficult. The precaution chiefly to be borne in mind with reference to the passages between the islands is, to keep, as much as winds and currents will permit, under the south side of the islands, so as to be always on the weather side of the channel, and therefore, with a port under the lee in the event of the bora coming on to blow suddenly. This is applicable to all other passages on the eastern coast of the Adriatic.

On approaching the islands, Mount Tmor serves well to indicate the position of the entrance to Meleda channel, which is at the western extreme of that of Calamota, and is used by coasting vessels only. In the winter season, violent currents set to the westward, and with south-easterly and southerly winds the shore of Meleda island should be closed to avoid rough water, under Sabbioncello peninsula; it is important not to be becalmed near the shore of the latter during these winds, which often die away towards the evening, leaving a considerable swell. With the bora, on the contrary, the coast of this peninsula should be hugged.

When the group is made from southward, or from south-eastward, a look-out should be kept for Cazza and Lagosta islands, the farthest from the mainland, and visible at a considerable distance. Mount Hum, at the west extreme of Curzola, will next be seen; then Zercedo, remarkable for the various shapes which its summit assumes; and subsequently, St. Georgio di Lagosta with its chapel: but the most conspicuous object, from whichever quarter the islands may be approached, is Mount Vipere on the mainland. Giuliana valley is the best guide to the western entrance of Meleda channel, and for the passage between Meleda and Lagostini islands.

On approaching the islands from north-westward or from westward, it is customary to make Planca point, which is easily recognized when arriving from south-westward or from the Italian coast; Pomo and St. Andrea islands are first seen, then Mount Hum of Lissa, Lissa island itself, and the two Zirone islands.

Cazza and Lagosta Channel.—If bound to Lesina, Brazza, or other channels, the passage between Cazza and Lagosta islands should be taken or both islands should be left on the starboard hand, and a course shaped for the western extreme of Lesina; this point is easily distinguished by the forts which crown the heights surrounding the town, and by Mount St. Nicolò.

Lagosta Channel is only used for passage through that of Meleda, or on quitting the latter from eastward. After long continued south-easterly winds, the currents are troublesome at the western entrance, and southerly winds cause a heavy sea; moreover, when they die away in the evening,

which is frequently the case, a vessel in the vicinity of Taino rocks, or of Boscagne shoal, may find herself awkwardly situated. It is necessary, therefore, to anticipate winds from this quarter, by being in a position to proceed to anchorage on the west side of Curzola.

Sabbioncello Channel is used by coasting vessels only, which also frequently take that of Curzola, in order to keep near shore when bound from the southward to Narenta or to Macarsca. The pilots generally pass on the north side of Torcola island, especially if the weather should appear threatening, in order to keep Porto Grande under their lee. If unable to reach this anchorage in a violent bora, it would be advisable to proceed to Port Lesina or to Torcola.

Neither the north-east channel of Lesina, nor that of Narenta are used in the course of ordinary navigation; they are chiefly frequented by natives passing to Macarsca on the mainland, or by vessels putting in from stress of weather. It should be borne in mind that after easterly winds the current generally sets eastward under Lesina, and assists when bound to the mainland. With these winds it is advisable to give a wide berth to Sabbioncello peninsula, along which there is no good anchorage in case of emergency.

Port Spalatro Channel.—Vessels bound to Spalatro generally pass through this small channel. If on arriving from southward the wind and current should be found unfavourable, a vessel may proceed to Port Milnà of Brazza if she should be far enough northward; otherwise, in order not to lose ground, to Lesina, or if she be of light draught, to St. Giuseppe of Brazza.

Brazza channel, like all others near the coast, is exposed to most violent bora gales. The native mariners anchor every night under the mainland, and when under weigh keep near it, so that when unable to pick up an anchorage off it, they may be in a position to fetch one in Brazza island.

The small Zirone and Solta channels are seldom used; in the former there is a very strong current always setting on the shore; if a vessel from the westward should, after passing Planca point, take it with a fair wind on her way to Brazza channel, she should be on her guard against the small Macina rock, in the western part of Spalatro channel.

Although southerly winds among the islands northward of Meleda and Lagosta are not troublesome, it would be prudent, in the event of threatening weather from this quarter in the neighbourhood of Meleda, when not wishing to enter a port, to proceed to Meleda channel, and anchor off Port Mezza Meleda in about 36 fathoms sandy bottom, at $1\frac{1}{2}$ mile from the shore. But it would be necessary to be prepared to get

under weigh at the dropping of the breeze, in anticipation of a bora gale. Shelter might also be sought in one of the ports southward of Curzola.

If a vessel from the eastward should be overtaken by a bora gale before she can reach the islands, she should go on the port tack and proceed to anchorage on the Albanian coast. If symptoms of this wind should be perceived in the neighbourhood of Narenta, or of Macarsca, the shore should be closed and the anchor dropped as speedily as possible ; but if surprised by it, it would be advisable to run at once for shelter to one of the ports eastward of Brazza, as the depth of water is too great for anchorage in Vrullia bay. If overtaken at a few miles from the Zirone islands, the best measure would be to haul close to the wind on the port tack, and endeavour to fetch Lesina channel. In the event of the wind drawing a-head, as often occurs here, St. Giorgio of Lissa should, if possible, be reached ; or if the vessel should be too far to leeward, she might proceed to Comisa.

It would be imprudent to have recourse to any of the ports in the vicinity of Planca point, as the bora, which varies in this part of the Adriatic between north and east, would probably be found on approaching the shore to blow in such violent squalls as to render it impossible to carry any sail. Neither would Zuri be available if the vessel were kept upon the starboard tack, as the violence of the squalls would drive her so far to leeward that she would be obliged to bear up for shelter on the coast of Italy ; in all probability she would be unable to weather Gargano heads, and would have to make for Tremiti islands.

If a bora should be encountered in Spalatro channel, and it should be found impracticable to reach Castelli anchorage, it might be convenient to anchor under Brazza island.

ROUTE to the NORTHWARD.—When proceeding to any of the northern ports, and arrived off Cape Linguetta, a course should be steered for Lagosta island, which should be sighted, as it is a good point of departure, whereas the islands off Planca point are frequently obscured in southeasterly and south-westerly winds. Having passed Lagosta, a look-out should be kept for Cazziola, and a course shaped for Cazza islet, and thence for Lissa, in order to pass to the southward of Busi islet, or between the islands : in the latter case a vessel should be on her guard against the currents which set with strength to the westward, and afterwards towards the eastern extreme of Lissa.

Although the above is the most prudent route at all seasons, vessels bound to Ancona sometimes shorten the passage by sighting Pelagosa island, which stands up like a column about 30 miles northward of Gargano head. When venturing upon this course in the

summer, time would be saved by passing between Pelagosa and Lagosta, rather than between it and Gargano ; for although at this time of the year the currents are ordinarily weak, they may, after heavy rains, be found sufficiently strong, southward of Pelagosa, to be inconvenient.

In the vicinity of Ancona, the south-easterly set is sometimes so strong that in light winds near the high lands, vessels frequently find great difficulty in reaching this port, or even the road, especially if care have not been taken to make the land well to the northward.

When vessels bound to Trieste or to Venice arrive off Lissa, they ordinarily shape a course for passing southward of Incoronata, Grossa, &c., sighting the light on Bianche point, of Grossa island, in the vicinity of Bacili rocks, and continuing on the same course for Promontore point.

In passing between Lissa and Promontore point, it is well to keep rather close to the islands, in order to profit by the ordinary north-westerly current, and to keep in a position to reach one of the numerous sheltered localities in the event of a bora gale arising. Among these the chief are ; Port St. Giorgio of Lissa, on the north side of the island ; Port Tajer, the open anchorage on the south-west side of Grossa, where a vessel may ride out a heavy gale ; farther to the westward, the open anchorage under Premuda ; Port Augusto of Lossini island ; Port St. Pietro di Nembo ; and the excellent anchorage of Unie channel, which has sufficient space for a fleet.

When abreast of the Quarnero gulf, it is prudent to be as near as possible to its entrance, so as to be enabled to proceed promptly to anchorage on the occurrence of a bora, the violence of which wind from the gulf is such that a vessel might be unable to carry any sail, and be driven upon the shore of Romagna, where there is no anchoring-ground whatever. It must not be forgotten, that in winds between south-east and south-west, a heavy sea sets upon the coasts of the islands between Planca and Promontore points, and as the wind frequently lulls towards the evening, the appearance of the weather should be carefully watched so as to remove in time from the shore, or to reach by one of the passages between the islands a place of shelter. Besides other warning symptoms, gales from the southern quarter are preceded by a long swell from the eastward ; in the winter season this swell continues some time after south-easterly winds have been succeeded by a bora gale.

When making the land about Istria on the way from the islands, the most remarkable object by day which is first seen after Grossa is Mount Osero, in the form of a cone, 2,230 feet high, at the north extreme of Lossini. When farther north the forked summit of Monte Maggiore, 4,531 feet, the highest mountain of Istria will be seen. During sea winds, particularly from the south-east, or when they may be

expected, the summits of the two mountains are always clouded; during land winds and at the cessation of sea winds they suddenly become clear.

Promontore point is dangerous, especially in thick weather, being very low and bordered by shoals; having sighted it, or at night the *fixed* light on Porer rock, the vessel should be kept at a distance of at least 3 miles southward until the sunken rock off it has been passed, especially in light winds and smooth water, as the current is then most rapid and sets with eddies in the direction of the shoals.

ISLANDS, &c. between QUARNERO and PLANCA POINT.—The navigation of the channels formed by these islands, and which are frequented by small craft, is very difficult, for they are not only narrow, but strewed with rocks and shoals which demand a thorough acquaintance; the bora, which is violent throughout the eastern coast, blows across them, and the currents are very rapid and changeable. Vessels of considerable draught in proceeding to the northward should keep outside the islands, unless bound to Zara or to Sebenico.

Zara and Sebenico.—When bound to Zara, or to Sebenico, the rocks abreast of Rogosnizza and Capo Cesto should, after Planca point has been sighted, be left on the starboard hand and a course shaped for Zlarina island.

The bora occasionally descends from the mountain valleys in the neighbourhood of Sebenico with such violence that even when close under the land it is not practicable to reach one of the anchorages on the coast, and it becomes necessary to stand close-hauled on the port tack for Lissa or for Lesina. South-easterly winds are sometimes troublesome between Planca and Sebenico, as they reach the channels, but, excepting in thick weather, shelter from these can always be reached.

In proceeding to Sebenico or to Vodizze, the coast should be closed as much as possible, and after having passed Capo Cesto rocks a course should be shaped for one of the passages which have been described.

In proceeding to Zara from Planca, four passages present themselves; the best of these, and the one generally used by the natives, is formed by Smajan and Zlarina islands. It is the weathermost, and by taking it a vessel is enabled to reach easily Pasman strait, and also to anchor securely in a bora gale. The two middle passages are not good; that between Zuri and Kakan is preferable to them, although the current is very rapid and changeable.

If forced to leeward of Zuri when bound to Zara, it would be necessary to go between it and Incoronata. Lucietta rock will be recognized

and passed ; a course should then be steered for Sedlo rock and afterwards for Vergada island, in order to pass between it and Jarta grande.

Pasman Strait, which must next be taken on the way to Zara, should not be attempted without a commanding breeze, especially in a large vessel, as the currents often set upon the shore at the rate of 3 miles an hour.

When standing for the group of islands westward of Planca point from the westward or south-westward, the summits of some of the islands, St. Michele castle, Mount Velastrasa, &c. north-eastward of the point may be seen at a considerable distance.

When proceeding to Zara from Ancona, a look-out should be kept for the light-house on Grossa island which marks the entrance to Sette Bocche channel. When arriving from the westward and abreast of Sette Bocche, a good berth should be given to Bacili rocks and a course steered for Golaz rock, which should be left a little on the starboard hand, and afterwards Sverinaz and Sestrugn islands, Ton grande rock, &c. on the same side. Having passed through, a course should be steered for the north-west point of Ugliano island, and thence for the port. If a bora gale should suddenly arise recourse may be had to the anchorage of Tre Sorelle.

If after entering Sette Bocche, it should be the intention to proceed to Mezzo channel, the passage between Grossa and Sverinaz islands, or that between the latter and Ton rock, should be taken. The Mezzo channel, which is the only navigable one southward of that of Zara, is used in cases of necessity by small craft : in fine weather these prefer the route southward of the islands, and in the bad season they usually pass between the Quarnero and Planca point by Zara channel.

GULF of QUARNERO.—The currents are more affected in the Quarnero, and among its numerous islands than elsewhere by the tidal wave, owing to the narrowness of egress for its waters ; at times a sailing-vessel can scarcely stem them without a fresh breeze in her favour. The bora also has great strength. The navigation of the Quarnero, although thus rendered difficult, is very important, owing to the commerce of Fiume, Porto Re, Segna, Nona, and the islands.

There are two passages to the Quarnero channels for vessels of large draught,—the grand Quarnero channel between Istria and Cherso island, and Quarnerolo channel, the principal entrance of which is between St. Pietro di Nembo and Premuda islands.

Quarnero Channel.—Vessels from the westward usually take the grand channel, in which the only danger is Galiola rock. With a flood-tide and

fair wind the east side should be preferred, as the current there sets to the northward during the whole of the flood : also when beating up with a commanding breeze, this side should have the preference, as in the middle of the channel, and on the coast of Istria, the current sets to the south-west. The wind veers to the eastward towards the middle of the channel, and is northerly in the vicinity of the Istrian shore.

If overtaken by a bora gale in the middle of the grand channel, it would be advisable, if far enough to windward, and the wind were not too violent, to make for Cherso bay, although the vessel might ride out the gale at anchor in the channel. Recourse might also be had to Osero channel, or to the lee of Promontore point, if not too far advanced.

Quarnerolo Channel is as much exposed as the grand channel to the bora, but as the south extreme of Lossini island, and St. Pietro di Nembo afford some shelter from the sea, vessels are enabled, excepting in a gale, to reach anchoring ground, or to close the shore. Premuda, Isto, Scarda, and Melada islands protect this channel from south-westerly weather.

ROUTE to FIUME.—If bound to Fiume or to Porto Re, a course should be steered when inside the Quarnerolo, for the small channel between Veglia and Cherso ; preparation should be made for a sudden blast of the bora when abreast of the passages south-eastward of Arbe island, in which event it may become necessary to run for shelter under the lee of Cherso. The currents vary greatly in rate and direction in the narrow part of the channel between Plaunich, Cherso and Veglia, and are influenced considerably by the waters of the Fiumara. The wind is often favourable for leaving Fiume when the scirocco blows on the other side of the passes.

Segna Channel is generally taken when bound to Segna or to Novi, on the coast of Croatia. The current in this passage between Veglia and Parvik islands is so rapid, and the bora so fierce and sudden in its approach, that even with a fair wind it is prudent to keep under snug canvas. If unable to get through this pass, a vessel may anchor at Veglia or in Barbato channel.

Pago Channel is usually taken by vessels proceeding to Morlacca channel. Carlopago is the only town of any importance on this part of the coast. If bound to Jablanaz, Arbe should not be closely approached, as there is a rocky bank with only one fathom of water on it, at 3 cables from the south-east point of this island.

Morlacca channel is only used by coasting vessels, which, in the bad season, moor every night. Squalls from the high lands bordering it are very troublesome, and there is no good anchoring ground along the rocky

Croatian shore. The spots at which it would be unsafe to anchor are clearly indicated by the destructive effects of the bora upon the coast.

Nona, on the mainland, is a town of but small importance : only vessels of light draught reach it by the small Pogliana channel between Pago and Puntadura islands, which has a depth of less than one fathom at high-water.

In quitting the Quarnero no difficulties present themselves, as the wind generally, and the currents frequently, are favourable.

ROUTE to TRIESTE.—After passing Promontore point, the coast of Istria should be closed, especially with contrary winds : the vessel will thus be in a better position for anchoring, if necessary, and the current sets northward within a short distance only from the bend. Coasting along, Cape Brancorso, and Drapano with its pointed steeple, will be seen; also Brioni islands and Rovigno with its lighthouse. Ordinarily, the weather will be found finer and the water smoother to the northward of, and often on nearing, Rovigno.

Having passed Rovigno light in the night, a course should be steered for Cape Salvore, the light of which is upon its south-western extreme. From Salvore, at which, in clear weather, the whole Gulf of Trieste is visible, a direct course may be shaped for Trieste light.

South-easterly winds frequently veer to the southward, north of Promontore point ; occasionally, especially in winter, they become more easterly, and then a bora may be expected. The high lands of Istria should be watched, and on their commencing to be clouded a place of shelter should be sought before the land becomes entirely concealed.

Frequently, vessels arriving off Salvore with a fair breeze meet contrary winds. In this case, if the weather be not threatening it is advisable to stretch away upon the starboard tack to the Duino shore, near which the vessel will probably break off, and look well up on the opposite tack. The lead should be carefully attended. Between Timavo and Grado, it is not safe to stand in to less than 5 or $5\frac{1}{2}$ fathoms, inside of which the soundings decrease suddenly.

The bora is very violent in the Gulf of Trieste. South-west and south-east winds, which blow dead upon the Venetian coast, are equally dangerous, but not so frequent.

If overtaken by a heavy bora northward of Salvore, and unable to reach Pirano anchorage, it would be necessary to bear up for Omago, which is well protected by Cape Salvore. It would not be safe to anchor on the open coast between Salvore and Trieste.

If unable from the violence of the gale to hold her own, when between Salvore and Promontore points, a vessel may anchor within about 6 miles of the coast of Istria ; outside of this, there would be a heavy sea in bad

weather. If reduced to bare poles, or in any other case of emergency, she might without great danger anchor between Rovigno and Salvore, as far as 18 miles from the shore in 16 to 18 fathoms; this would be preferable to the risk of being driven upon the coast of Italy.

If, on entering the Gulf of Venice, at night, a south-west gale should be encountered, it would be advisable, after obtaining sufficient offing, to lie to, till enabled by daylight to seek the most convenient place of shelter.

As pilots are generally procured at Rovigno, it is from this place that vessels ordinarily proceed to Venice, or to the ports of the lagoons; but from whatever part of the Adriatic proceeding, it is prudent to sight and take a departure from the Istrian coast, where, also, favourable weather may be awaited for crossing the gulf to the Venetian shores.

THE VENETIAN COAST.—Too great precaution cannot be taken on approaching this shore in sailing-vessels, especially with obscure weather, when it is unadvisable to attempt to sight it. Vessels of considerable draught, particularly, should abstain from closing the ports in strong south-easterly or north-easterly winds, or when a long swell is setting in. Proceeding from Istria to Malamocco, the only port of the lagoons for a large vessel, a course to windward of the port should be shaped to allow for the rapid southerly set of the current near the western shore; and great attention should be paid to the soundings. At night it would not be prudent to stand in to less than from $5\frac{1}{2}$ to 8 fathoms, which depth is about $1\frac{1}{2}$ mile from the shore.

Malamocco has sufficient depth at high-water, for a vessel drawing 16 feet to enter it and proceed by St. Spirito channel to Venice. It is customary to discharge here the pilot procured at Rovigno, and to procure a local one.

Tre Porti, which is nearer Venice, is frequented by small craft.

Chioggia is very shallow, and the passages to it have scarcely sufficient depth for boats.

The currents are very rapid after rainy weather, and the shoals at the entrances to the ports are modified by them. In the early part of the day during summer, land breezes enable vessels to secure a favourable position for entering with the sea breeze which sets in rather regularly from south-west, or from south-east; from the latter quarter often suddenly, and with considerable strength, and if a long swell should be experienced, and the land be overcast, and there should not be time for the vessel to reach her port, one of the anchorages on the coast should be taken for the short period during which, at this season of the year, a south-easter may be expected to last.

In the winter, the bora and south-easterly winds render the navigation of the coast between Piave and Maestra almost impracticable, and the

coasting vessels then pass, by the channels, from the Gulf of Goro to Venice.

In the summer, it is usual for vessels to anchor along the Venetian shore at the distance of about a mile or half-a-mile, in 6 to 7 fathoms. The best anchorages are those of Cortellazzo, Mezza Sacca, and Pelorosso. At Pelorosso a vessel is more conveniently situated for proceeding to sea at the approach of bad weather. It is sometimes convenient in fine weather to anchor till daylight off Malamocco in about 3 fathoms, with St. Marco steeple in line with that of Malamocco, or to make fast to the buoy at the entrance of the port.

From Trieste to Venice.—It is customary when bound to Venice from Trieste, to make the land near Grado, on account of the southerly current, and to coast along to the ports of the lagoons; this precaution is the more necessary, as it would be dangerous to be carried into the vicinity of Maestra, which abounds in shoals. Care is also required in quitting the lagoon ports, especially Chioggia, after leaving which a depth of 11 to 13½ fathoms should be preserved until Maestra point has been passed.

From Ancona to Venice.—The coast should not be approached between Venice and Rimino, nor a less depth than 16 or 17 fathoms obtained. Southward of Rimino the soundings increase, and a nearer approach may be made, especially when proceeding southward, for the sake of the in-shore current; and in calms or land winds, a vessel may anchor in about 11 fathoms, 3 miles from the coast.

From Ancona to Trieste.—The shore of Istria should be coasted, and Promontore point sighted; allowance being made on the way for the probability of being set to the south-eastward by currents.

MANFREDONIA.—The Gulf of Manfredonia affords the best refuge on the west coast from a bora, and would be probably within reach, if a gale from this quarter should arise before Lissa has been passed. The high land of Gargano is an excellent mark, and as soon as the mount is seen by a vessel from Cattaro, Ragusa, &c., or which has not yet arrived to the westward of Lagosta, a course should be shaped to bring it a little on the starboard bow; but if the gale should overtake when beyond Lagosta, she should at once haul as close to the wind as expedient, in order to weather Viesti point, the eastern extremity of Gargano head.

Tremiti Islands.—If overtaken by a bora too violent for the vessel to be kept at sea, when westward of Lissa and unable to fetch Manfredonia, an attempt should be made to reach Tremiti islands; failing in which there would be no resource but the entirely exposed anchorages on the Italian coast.

The islands are very low and inconspicuous ; but in weather, such as generally obtains during a gale from this quarter, they may be often seen at a distance of 12 miles. Care should be taken to verify the vessel's position before making for the Tremiti, in order to ensure clearing the very low and dangerous Pianosa isle.

On quitting Tremiti islands or Manfredonia for the coast of Dalmatia, or to proceed farther up the Adriatic, the Dalmatian shore should be closed as speedily as possible, especially in the winter season. If bound to the westward, the passage between Pelagosa and Pianosa isles will be taken, and a course shaped for Planca point ; St. Andrea, Pomo rock, and Mount Hum of Lissa island will be passed within view. When bound from Manfredonia to the neighbourhood of Cattaro in the bora season, it is advisable to sight Lagosta.

From Trieste Outwards.—If outward bound from Trieste, or from Venice, or from the coast of Istria, it is customary to make Promontore as a point of departure, especially in the autumn and winter seasons. The islands between it and Lissa should be coasted, following the directions given for proceeding to the northward, but keeping, in fine weather, farther from the shores to avoid, in some measure, the strength of contrary currents. Lagosta light will be seen, and thence a direct course out of the Adriatic may be shaped. In summer, if the weather should promise to be fine, vessels may venture to keep on the Italian shore, for the sake of the southerly current.

On leaving Ancona in the winter season, either for the eastern coast or to quit the Adriatic, the islands should be closed as soon as possible. The current will be found setting to the south-east during the first part of the route, and more southerly near the middle. In moderate weather, and near summer time, a course may be shaped to weather Pomo rock, in order to sight Lissa, &c. ; but if bad weather should be apprehended, it would be advisable to make at once for Grossa, and then coast along the islands.

On the Italian coast, in summer, vessels will be almost always assisted by land-breezes during the night, and early part of the day, as well as by the currents, which are, however, feeble at a short distance from the shore ; and in light contrary airs the anchor may be dropped at two or three miles from the land, between Ancona and Gargano, and even as far as Cape Otranto. As the coast is generally very low, great attention should be paid to the soundings ; at night, less than $8\frac{1}{2}$ to 9 fathoms should not be obtained, and if signs of a bora gale should be perceived, it would be prudent, even in summer, to stand out at once. Tremiti islands, or Gargano, might then be convenient anchorages to resort to, or Brindisi, if the vessel should be to the southward of Gargano.

The ABRUZZO COAST is dangerous in a bora gale, from which it affords no shelter. Nevertheless, this wind does not blow home with violence, owing to the bordering high lands, and during even heavy weather outside, the land breeze often continues throughout the night.

The COAST of FOUILLE ought not to be approached without caution, especially when there is any appearance of a coming bora ; if overtaken near the shore by this wind in strength, a vessel, if too far to leeward to fetch Brindisi, should haul close to the wind and endeavour to quit the Adriatic.

In the Adriatic sea, more than in most localities, it is of importance to watch atmospheric appearances ; and it is seldom that the attentive mariner may not observe some premonitory symptoms of the winds most to be apprehended.

CHAPTER III.

WESTERN COAST.—CAPE STA. MARIA DI LEUCA TO TRONTO RIVER.

VARIATION $11\frac{1}{2}^{\circ}$ to $13\frac{1}{2}^{\circ}$ West in 1861.

THE western shore of the Adriatic sea comprises the coasts of Naples, the States of the Church, and of Venetia.* The Neapolitan coast embraces the whole extent of 300 miles between Cape St^a Maria di Leuca and Tronto river, and is divided into Otranto, Bari, Capitanata, and Abruzzo provinces. Excepting the easternmost portion, and Gargano head, this shore is generally low, but of easy navigation in the summer season ; it is populous, and resources of all kinds, including water, may be readily procured.

CAPE STA. MARIA DI LEUCA, also called Leuca point, which is the western extreme of the entrance to the Adriatic, is about 520 feet above the sea, and is easily recognized from the southward, by a church, a white signal-tower, and a group of houses on its summit ; it juts out to a considerable distance south-eastward, sloping down gradually to the sea.

The shore immediately to the westward of Leuca point should not be closed, on account of shoals ; in ordinarily clear weather its features are sufficiently distinguishable at a distance of 5 or 6 miles ; but at times it is enveloped in heavy clouds.

ANCHORAGE.—There is excellent shelter for vessels driven from the northward by a bora gale, in a small bay westward of Leuca, between it and Ristola point ; south-east and south-west winds send in a heavy swell, but those between north-east and west are little felt. The best anchorage is at the entrance, in 9 to 11 fathoms, sand ; the church bearing E. by N. and Uomo morto tower N.W. by W., the extreme of Leuca point being just open.

As heavy bora squalls reach this anchorage, vessels, with the wind from this quarter, moor with open hawse to the northward, and a good scope of cables.

THE COAST between Leuca point and Otranto, 20 miles northward, consists chiefly of well cultivated rocky elevations, with numerous villages and towers. Castro town may be easily distinguished. The shore is

* See Admiralty Charts, Adriatic Sea, No. 1,440 ; scale, $d = 3.1$ inches ; and East Coast of Italy : Cape Vaticano to Monopoli, No. 198 ; scale, $m = 0.18$ inch.

almost everywhere of bold approach with soundings of 11 to 17 fathoms, which increase to 36 and 54 fathoms near Leuca point; but the small Castro bay is the only anchorage along it which affords even temporary shelter; and as moreover, the south-easterly current is very rapid, a vessel should not close this part of the coast excepting when leaving the Adriatic with a commanding breeze.

The numerous towers, erected at intervals for defence in former times, are convenient guides for coasting-vessels running for shelter to various little creeks: the most conspicuous of these buildings are Montelungo telegraph, about 2 miles north-eastward from Leuca; the ruinous tower Novaglie, a short distance beyond which are those of Borraro, Specchia grande and Pallano; and Andrano tower, 10 miles from Leuca point, and to the northward of Port Tricase anchorage, which is indicated by some houses on the beach, and is accessible to boats alone.

Sasso tower is about one mile from Tricase; abreast of it is the islet or Isola, and on a height above it the tower of the abbey of St. Maria di Mito.

PORT CASTRO.—Maccarone point, about 12 miles from Leuca, is a steep rocky promontory, which jutting out south-eastward forms Port Castro bay, the town of which is situated on the promontory; this anchorage is quite sheltered from winds between north and south-west, but much exposed to those from east and south-east. Vessels anchor about half-a-mile south-westward from Maccarone point, in 8 fathoms mud and weeds, the town bearing N. by E. This anchorage is used by vessels which, in the fine season, are unable to beat into the Adriatic against the current during long continued north-westerly winds.

Water may be obtained about a mile south-westward from the anchorage at a narrow stream which flows into Cala dell' acqua viva, or fresh-water creek.

PORT BADISCO is a small bay about 5 miles northward from Castro; between them is the tower of Miggiano. Badisco has only sufficient space to shelter from westerly and northerly winds a few vessels drawing about 6 or 7 feet water; it is in some measure sheltered from sea-winds by rocks, which lying in the passage render access difficult, especially in south-east winds, when a considerable sea is raised. Vessels moor head-and-stern with four anchors in this small place, the site of which is pointed out by its tower, the largest in the vicinity.

St. Emiliano tower is to the northward of Badisco, and near it is a small rock of the same name; about a mile beyond the latter is Cape Otranto.

CAPE OTRANTO lies 20 miles north-eastward from Leuca point; it is formed by a mass of high precipitous land, the coast-line of which is $1\frac{1}{2}$

mile in extent, and includes two long points jutting out eastward. On the northernmost of these points are two towers, the innermost of which has the appearance of a small castle; the outer, or Orto tower, is in a ruinous condition. On the southernmost point is Palascie tower; close in to the land is a rocky shoal of 3 or 4 fathoms; the depth is 22 fathoms between it and the shore.

PORT OTRANTO, ancient *Hydruntum*, is a bay, the entrance to which is half a mile wide, St. Nicolò point forming the south-east, and the low rocky Craul point the north-west extreme.*

St. Nicolò point, the inner portion of which is rather elevated, terminates in a line of rocks which are awash, and afford some protection to the port against easterly winds.

Secche sand-bank, containing several rocks awash, lies about three-quarters of a cable north-westward from the rocks off St. Nicolò point; between, is a passage nearly two cables wide, with a depth of $3\frac{1}{2}$ fathoms. Secche shoal contributes to the protection of the anchorage from easterly winds; there are a few detached rocks between the shoal and the town.

The anchorage of Otranto is between St. Nicolò point, the Secche, and the town, in 3 to 4 fathoms, bad holding-ground; the bottom is rocky on the north-east and south-west sides. North-easterly and easterly winds send in a considerable sea, but the shelter from north, south-east, west, and south-west winds is very good. If threatened by a heavy north-easter, cables should be taken to the shore. Vessels not intending to enter port, anchor in 5 or 6 fathoms outside a line joining the Secche shoal, and a building enclosed by walls, which stands on the right of the entrance.

Otranto town, which contains about 3,000 inhabitants, is now of small importance. It is on a rocky site on the south side of the bay, and protected by surrounding wall and a castle. At Otranto, as at Brindisi, the agricultural produce of the interior is exported, and foreign merchandise received by the inland inhabitants. A submarine electric telegraph cable from Otranto to Corfu was laid in February 1861.

Supplies, including spring-water, at the north-west bastion outside the town, are plentiful; coasting-vessels are constructed on the beach.

DIRECTIONS.—The steeple of Lecce cathedral, N. $\frac{1}{2}$ E., 20 miles from Otranto, is the first conspicuous object which presents itself in clear weather to a vessel bound to the latter from the Adriatic: when approaching from south eastward the high Cape Otranto, with a tower on each of the two hillocks which form its summit, is the first distinguishable mark. After passing the cape, the Capuchin convent on the west side of the bay,

* See Plan of Port Otranto, No. 1,499; scale, $m = 2$ inches.

and afterwards the town and its castle, will be easily recognized. The town should be steered for when seen, taking care to give the north-west point of the bay a good berth; the Secche, and the rocks projecting from St. Nicolò point, will become visible, and, with a commanding breeze between north and east, the passage between them, having a depth of $3\frac{1}{2}$ and $4\frac{1}{2}$ fathoms, should be taken, borrowing rather on the Secche side. In taking this passage, a vessel should haul up promptly to starboard after rounding the shoal, as the depth decreases rapidly to the southward.

It is impracticable to beat into Otranto against westerly and south-westerly winds, owing to the shallowness of the south and south-west parts of the bay; and a good anchorage in 5 or 6 fathoms sand will then be found between the Secche and the north-west point; but the anchor should be weighed at the first symptom of a breeze from seaward.

Bora gales occasion a very heavy sea in the bay, and it would be unsafe when this wind is threatening for vessels to attempt to enter. In such a case every endeavour should be made to weather Cape Otranto, and then to proceed under easy sail to the anchorage under Leuca point.

LA SCALA is a rocky 3 fathoms shoal, which breaks in heavy weather. Craul point bears from it S.W. by S., three-quarters of a mile, the Capuchin convent S.W. $\frac{1}{4}$ S., and the town fort S. by W. $\frac{1}{4}$ W. Vessels approaching from the northward should not pass within one mile of Craul point.

THE COAST from Otranto to near Lecce town, consists chiefly of rocky, wood-crowned elevations, with richly cultivated ground, especially in the neighbourhood of the former; it then presents a low level outline and marshy country, without a single dwelling southward of Brindisi, and the steeple of Lecce, which stands on a hill 6 miles inland, is the only conspicuous object, until the shore is closely approached, when some towers which mark the temporary anchorages of coasters become visible.

At about a quarter of a mile from the land the bottom is sandy; at one mile it is muddy; and becomes rocky with patches of mud outside of this. In fine weather, vessels may without risk coast along at a distance of one mile.

ANCHORAGES.—It is seldom quite safe to anchor off this unprotected coast. Small vessels, however, come to temporarily at the following places :—

Alimini is a sandy bay, 4 miles north-westward from Otranto, and abreast of a lake of this name: the best berth is about 2 cables from the shore, in 3 or 4 fathoms, with the ruins of Fiumicello, the second tower beyond Otranto, bearing N. by E. one mile. Vessels also anchor in the offing in depths of 10 to 13 fathoms.

Orso.—This anchorage, 8 miles northward from Otranto, is marked by a tower, and by a church a quarter of a mile from the shore. It is formed by a small bay, in which a depth of 4 fathoms, good holding-ground, will be found between the tower north-westward and Matarico point eastward. Vessels also bring up to the southward of Orso point in 7 or 8 fathoms.

Northward of Orso tower are those of Rocca Vecchia and Specchia Ruggieri; the 4 miles of coast between which, and as far as St. Cataldo, are bordered by rocks awash. Near Rocca Vecchia tower are a small church and the ruins of a few houses.

St. Cataldo anchorage bears E. $\frac{1}{4}$ N. from Lecce town. The anchor should be dropped in about 3 fathoms, mud, at rather more than 2 cables from the shore, St. Cataldo castle, which stands on a sandy point, bearing N. by W. half-a-mile; a rocky shoal projects from the point.*

Two miles northward of St. Cataldo is Venere tower; 3 miles beyond the latter is that of Chianca, abreast of which some rocks extend about half a mile. Rinalda and Specchiola towers next appear; off the latter a rocky shoal stretches about one mile eastward, terminating close to depths of 9 and 11 fathoms.

St. Gennaro.—Vessels also bring up southward of St. Gennaro tower, which lies 3 miles from that of Specchiola, the depth being 4 fathoms, mud and weeds; and finally under Cape Cavallo, the eastern entrance of Brindisi bay, where good shelter from winds between north and west will be found in 3 or 4 fathoms, sand, at nearly 3 cables from the shore.

BRINDISI; PORT and ROAD.—Brindisi derives considerable importance from its being by far the best anchorage for large vessels on the western shore of the Adriatic, and also from its being conveniently situated for vessels bound to the Albanian coast, or to the Ionian islands. Cavallo point, a very low projection, marked by a tower on its extremity, and Cape Gallo, a prominent elevation north-westward $4\frac{1}{2}$ miles from it, form the bounds of the bay. The road is partially protected from easterly winds by Petagne rocks and by 2 islets, and extends south-westward about 2 miles, terminating in a small channel which surrounds the town and serves as its port.†

The entrance of the port is at the south-west extreme of the road, and the passage to it is by Pigonati channel, which is 3 cables long and only 37 fathoms wide. This channel, which is between walls, and has a depth of about one fathom at low water, separates into two branches at a small sandy islet near its extremity, one of them flowing along the north-western, and the other along the south-eastern wall of the city. The

* It is proposed to exhibit a light on St. Cataldo point.

† See Plan of Brindisi Harbour, No. 1,492; scale, $m = 2\cdot3$ inches.

former and wider branch has a depth of 4 to 6 fathoms ; the latter has little more than 2 fathoms, muddy bottom. Vessels generally haul in close under the north-west wall, so as to shut in the channel forming the entrance to the port.

The town of Brindisi, ancient *Brundisium*, formerly of great consideration, now contains scarcely 7,000 inhabitants, being rendered unwholesome by marshy grounds in the vicinity, and by large quantities of seaweed which accumulate upon the shores. It is still the place of exportation for the produce of the whole of this part of Italy. Ship supplies of all kinds, including water, may be procured ; the latter from a fountain near the custom-house. Coasting-vessels are built here ; an hospital and bond store-houses are near the shore.

Brindisi road, properly so called, forms the south-west part of the bay, and is between the two islets and the town. The anchorage for large vessels is in 5 to 7 fathoms, mud and sand, opposite some large red-coloured patches on the shore, with the lighthouse bearing N.E. by E. $\frac{1}{2}$ E., and about 3 cables south-westward from Castello di mare islet ; when intending to remain some time, it is customary to moor with open hawse to the northward, backing the eastern anchor.

Vessels of light draught anchor in 4 or 5 fathoms on the west side of Castello islet, laying out a cable to it. Easterly winds alone are troublesome at this anchorage, but the Petagne rocks protect it from the heavy seas.

LIGHTS.—A *fixed* white light, 106 feet above the sea, and visible in clear weather about 10 miles, stands upon the fort on Castello islet. A *fixed* and *flashing* light, showing a flash every 3 minutes, at 72 feet above the sea, and visible above 13 miles, was recently placed on the north-western of the Petagne rocks. Also a *revolving* light, attaining its greatest brilliancy every *half minute*, at a height of 129 feet, and visible 20 miles, is placed on Torre di Penne, Cape Gallo.

The Petagne Rocks are five low rocks lying on the line joining Cape Gallo and Cavallo point. They are a continuation of a shoal which runs off from the north-west extreme of the latter, and the highest parts of which are named Visconti and Soldan ; the easternmost rock is about 3 cables from the eastern shore of the road ; Petagne grande, the largest, has a depth of $2\frac{3}{4}$ fathoms at half a cable from its north side, and also between it and the others, the soundings increasing southward.

Castello di Mare Islet.—This rocky islet and Lazaretto island are connected by a bridge, and lie one mile westward from Petagne rocks, affording protection to the western part of the road from north-easterly winds. A bank, consisting of patches of rock, sand, and weeds, runs off a little farther than one cable from the south-west point of the islet, and at the southern edge of it lies the small awash rock Gavi-

tello ; the shoal water which surrounds both islands does not, elsewhere, extend beyond half-a-cable from them.

Lavoro Spit.—This shoal forms a continuation of Lavoro point on the south side of the road, contracting the passage to the inner part of the latter, and extending about 3 cables north-eastward from the point, in depths of about 2 fathoms.

DIRECTIONS.—The land in the vicinity of Brindisi, being very low, is sometimes difficult to recognize, especially in southerly winds, when it is enveloped in clouds, and it becomes very necessary to keep the lead going. At the depth of 55 fathoms, mud, the vessel will be about 7 miles from the land ; inside of this the bottom is weedy abreast of Cavallo point, hard mud off Cape Gallo, and gravel between them. In thick weather, Castello islet which first becomes visible should be looked out for.

Lecce steeple is, even in clear weather, the only object which can be distinguished, till a near approach, by vessels from the eastward or south-eastward. If arriving from the northward or north-westward, Penna tower on the extremity of the high, rocky, Cape Gallo will be the object first seen on this very low coast, which is not visible beyond 7 or 8 miles. Cavallo tower, a high, square, building on the extremity of the point, will next make its appearance ; Castello islet will soon afterwards be seen.

Vessels may enter Brindisi road by passing on either side of Lazzaretto and Castello islands. The western, or Mater Domini, or Pouille pass, which runs north and south, should be preferred with winds between north and west, excepting by vessels of considerable size as the width is only about $1\frac{1}{2}$ cable ; the soundings in the middle are 5 and 6 fathoms, shoaling to the southward. When making for the western pass, Penna tower should be steered for as soon as recognized, giving the cape a good berth, and a course shaped for Castello islet directly the channel is opened, taking care to borrow rather on the side of the islands to avoid shoal water. The islet is of rather bold approach, but the anchorage or harbour should not be steered for till the east extreme of the town has been brought to bear S.W. $\frac{1}{4}$ W.

The eastern pass, which should be preferred by large vessels, especially with winds between north and east, is very narrow between Castello bank and Lavoro spit ; to enter it a course should be steered for Castello islet, for the fort by day, and for the light by night, as soon as it is seen, and the Petagne rocks should be left at least $1\frac{1}{2}$ cable on the port hand.

A small *white* buoy marks the extreme of Castello shoal, and a *black* buoy that of Lavoro spit.

A course should be steered for midway between the two most con-

spicuous steeples of the town as soon as they become visible ; the higher and right hand one is the column-shaped steeple of the cathedral. Casale convent will be seen on an eminence, and when the guard-house on the western beach is in line with its eastern angle, the vessel should haul up to starboard and run on this bearing till she reaches the anchorage beyond the south extreme of the fort, which will then bear N.E. by E. $\frac{1}{2}$ E.

In making for the port of Brindisi by night the light should be kept on a N.E. by E. $\frac{1}{2}$ E. bearing after entering the road ; by day, a white tower, formerly the lighthouse, should be kept in one with Brindisi church steeple. The starboard shore of the channel should be preferred, as the soundings there decrease more gradually. Vessels which do not enter port bring up between the islands and Petagne rocks, in 8 or 10 fathoms, sand and weed ; the best anchorage is in 6 and $6\frac{1}{2}$ fathoms, at rather more than 2 cables from Castello di Mare, the lighthouse bearing west.* Vessels of light draught making the land at Cavallo point may pass either inside or outside of Petagne rocks, in a depth of $6\frac{1}{2}$ feet, mud and weed ; close to the rocks the depth is 10 feet.

THE COAST between Brindisi and Gargano head is generally low, Mount Gargano being the only mark for vessels making for the land until approaching within 10 or 12 miles, when in clear weather the towns, villages, and towers scattered along the shores, many of them on eminences, will be distinguished.

Between Brindisi and the vicinity of Barletta, 87 miles distant, there are numerous towns, each of which has a small port frequented by coasting vessels. At Monopoli the flat country disappears, and the land maintains a moderate elevation, with patches of cultivation to near Barletta, beyond which, and as far as the Gulf of Manfredonia, sandy marshes prevail, which together with Salpi lake render the climate too unwholesome for habitation. This coast may be safely navigated at the distance of a mile, and in fine weather, with land winds, even large vessels may temporarily anchor at about this distance from it, in 13 to 17 fathoms, hard mud.

ANCHORAGES.—Although the harbours on this coast are accessible to small craft only, there are tolerable anchorages abreast of some of them, and a short description of these and of the various points of recognition scattered along the shore, will be useful. Penna tower, on Cape Gallo, bears about N. by W., 3 miles from Brindisi lighthouse, and is a good guide to vessels bound to Brindisi from the northward.

* Gautier's plan (1818), shows a rocky patch in Brindisi road at nearly half a mile S.E. of the south-west angle of Castello islet, and at rather more than three quarters of a mile W. by S. $\frac{3}{4}$ S. of the small Petagne.

Ostuni and Carovigno towns, both situate on elevated ground, are good points for making the land between Brindisi and Monopoli, in order to anchor off the coast at Villanova, or St. Stefano, or elsewhere. They are 14 and 17 miles from Brindisi, and about 3 miles from the shore respectively. Ostuni is fortified.

Small coasting-vessels, which can, if necessary, haul up on the shore, anchor at a short distance from it during fine weather, in the creeks pointed out by towers; among other places to the westward of Penna and Testa towers; to the south-eastward of Guaceto, or Vacito tower; among the Fornello rocks; and off St. Sabina and Pozzelli towers.

PORT VILLANOVA.—Villanova is 19 miles from Brindisi, and nearly due north of the hillock on which stands the town of Ostuni; it is accessible to small craft only, which anchor abreast of a small fort close to the shore.

St. Leonardo tower is 32 miles from Villanova, and $3\frac{1}{2}$ miles farther are the tower and the small fort of Canne; 5 miles beyond the latter is Ignazia point, upon which are the ruins of the ancient town of this name; and finally, St. Giorgio tower, close to which is a boat creek. Between this tower and Ignazia point, boats can without difficulty haul up on the shore, a convenience not afforded by any portion of the coast within 4 or 5 miles to the northward of the tower.

Cinto and St. Stefano towers are next to St. Giorgio; near the former is Recchione creek. At St. Stefano is a small harbour for fishing-boats; it is 3 miles south-eastward of Monopoli, and may be recognized by a very large edifice on an eminence close to the sea.

PORT MONOPOLI.—The port, which lies between the Castle point and the old town, is a very narrow inlet less than one cable in length; it is exposed to northerly winds, and the holding-ground is bad. Small vessels anchor in 6 to 10 feet, sand and rock, with a warp to each shore. A semicircular jetty improves the small natural capabilities of this anchorage.*

Large vessels anchor abreast of, 2 miles from, the town.

The town stands amidst olive, lemon, and orange plantations, on rather elevated ground near the shore; the outer portion of the walls which surround it being washed by the sea. It contains about 15,000 inhabitants, and is defended by a castle. Oil is exported in considerable quantities, and the contiguous lands are fertile, well cultivated, and present a picturesque appearance.

* See Chart, Adriatic Sea, Monopoli to Fossaceca No. 199; scale, $m = 0.18$ inch.
[AD. S.] D

LIGHT.—An *intermittent* light of the sixth order stands on the extremity of the jetty, and may be seen in clear weather at the distance of 8 miles.

PORT POLIGNANO.—This small port is fit for boats only; it is 5 miles from Monopoli. The town is on a steep craggy rock surrounded by olive trees, and at the foot of which is a fine spacious cave.

Between Polignano and Monopoli are Orto and Alcina towers; beyond these is St. Paolo rocky islet, on which are the ruins of a monastery. This part of the coast has a fringe of rocks, and is nowhere of safe approach. St. Vito tower, which has a large building to the southward of it, is $1\frac{1}{2}$ mile from Polignano; beyond it is Ripagnola tower on a jutting-out point, and $4\frac{1}{2}$ miles farther is the tower of Mola.

PORT MOLA.—Coasting-vessels anchor both on the east and on the west side of Mola; eastward, in a small harbour, where in a depth of $6\frac{1}{2}$ feet they lie sheltered from northerly winds by a rocky ledge, which extends half a cable south-eastward from the north extreme of the town; and westward of the town, between the castle, and a pier which runs out perpendicularly from the shore. A jetty supported by arches and piles has been built on the rocky ledge above mentioned, which thus greatly protects the port.*

In fine weather vessels anchor in $5\frac{1}{2}$ fathoms, hard mud, about half a mile from the town, which may be recognized by the lighthouse and by two white conical steeples.

The small town stands close to the seaside on a low shore. It is rich, but has little trade; it contains about 8,000 inhabitants.

LIGHT.—An *intermittent* light of the sixth order, stands on the eastern extremity of Mola pier, and is visible in clear weather at about 9 miles.

PORT BARI.—The coast between Mola and Bari, 11 miles distant, is bordered by rocks, and presents no remarkable features, excepting Pelosa and Carnosa towers, and St. Giorgio marsh which communicates with the sea. Although small and shallow, Bari, which is on the south-west side of the town, is the most important port on this part of the coast; it is protected northward by the town walls and by a mole; another mole extending north-eastward from the beach, shelters it on the south-east quarter. The entrance between these piers is open to the eastward, and nearly one cable wide. Inside, the depth is only $6\frac{1}{2}$ feet; the space is sufficient for about 30 vessels, which moor under the north pier with their heads to the eastward, and an anchor laid out in this direction against the heavy sea which occasionally sets in.

* See Plans of Mola and Bari, No. 1,642; scale, $m = 3.5$ inches.

The city, ancient *Barium*, is close to the sea upon a low jutting-out point; it is fortified and well built; is the capital of the province of Bari; contains 19,000 inhabitants, and is the chief commercial town on the coast, exporting considerable quantities of corn, wine, oil, almonds, potash, &c. The environs are fertile. Many ancient tombs and some fine vases have been discovered.

DIRECTIONS.—Port Bari is of difficult access in northerly, and in easterly winds; in the former, the sea washes over the piers. Care must be taken to avoid a rocky bank awash, which breaks in heavy weather; it lies nearly two cables north-eastward from the end of the northern pier. With a northerly wind a vessel should steer for the north extreme of the town, till at a short distance from it, when a course for the pier should be shaped, and, keeping close to it, the anchor should be dropped on having rounded it. With a south-east wind, it is advisable to keep along the southern pier.

Vessels of large draught anchor in 17 fathoms, sand, about one mile off Bari, either with the two conspicuous steeples of the town in line, or with the castle between them. This spot is sheltered from southerly and from westerly winds, but greatly exposed to those from north and from east. Nearer the town, especially between the depths of 10 and 5 fathoms, the bottom is very foul.

The town of Bari is readily distinguished from the eastward by the two steeples above-mentioned, the higher of which is square, of a brown colour, and surmounted by another small steeple. The castle, with its two black towers, will afterwards be seen, and then the high walls of the town.

BARI—NEW PORT, is now being constructed on the north side of the town of Bari. The mole extends in a north-west direction from the most prominent inhabited part of the town, and it has already reached to the distance of 255 yards.* The soundings are 4 fathoms at the extreme point of the mole, decreasing gradually towards the shore. The works completely protect the port from strong E.N.E. winds, but it is imperfectly sheltered from N. and N.W. winds. The entrance lies N.W. of the lighthouse.

LIGHT.—A *fixed red* light is exhibited from a moveable lighthouse placed on the extremity of the mole: it is 21 feet above the sea, and visible at the distance of 5 miles.

* Sicilian Government Notice; January 1860.

LIGHT.—An *intermittent* light of the sixth order stands on the extremity of the jetty, and may be seen in clear weather at the distance of 8 miles.

PORT POLIGNANO.—This small port is fit for boats only; it is 5 miles from Monopoli. The town is on a steep craggy rock surrounded by olive trees, and at the foot of which is a fine spacious cave.

Between Polignano and Monopoli are Orto and Alcina towers; beyond these is St. Paolo rocky islet, on which are the ruins of a monastery. This part of the coast has a fringe of rocks, and is nowhere of safe approach. St. Vito tower, which has a large building to the southward of it, is $1\frac{1}{2}$ mile from Polignano; beyond it is Ripagnola tower on a jutting-out point, and $4\frac{1}{2}$ miles farther is the tower of Mola.

PORT MOLA.—Coasting-vessels anchor both on the east and on the west side of Mola; eastward, in a small harbour, where in a depth of $6\frac{1}{2}$ feet they lie sheltered from northerly winds by a rocky ledge, which extends half a cable south-eastward from the north extreme of the town; and westward of the town, between the castle, and a pier which runs out perpendicularly from the shore. A jetty supported by arches and piles has been built on the rocky ledge above mentioned, which thus greatly protects the port.*

In fine weather vessels anchor in $5\frac{1}{2}$ fathoms, hard mud, about half a mile from the town, which may be recognized by the lighthouse and by two white conical steeples.

The small town stands close to the seaside on a low shore. It is rich, but has little trade; it contains about 8,000 inhabitants.

LIGHT.—An *intermittent* light of the sixth order, stands on the eastern extremity of Mola pier, and is visible in clear weather at about 9 miles.

PORT BARI.—The coast between Mola and Bari, 11 miles distant, is bordered by rocks, and presents no remarkable features, excepting Pelosa and Carnosa towers, and St. Giorgio marsh which communicates with the sea. Although small and shallow, Bari, which is on the south-west side of the town, is the most important port on this part of the coast; it is protected northward by the town walls and by a mole; another mole extending north-eastward from the beach, shelters it on the south-east quarter. The entrance between these piers is open to the eastward, and nearly one cable wide. Inside, the depth is only $6\frac{1}{2}$ feet; the space is sufficient for about 30 vessels, which moor under the north pier with their heads to the eastward, and an anchor laid out in this direction against the heavy sea which occasionally sets in.

* See Plans of Mola and Bari, No. 1,642; scale, $m = 3\frac{1}{2}$ inches.

The city, ancient *Barium*, is close to the sea upon a low jutting-out point; it is fortified and well built; is the capital of the province of Bari; contains 19,000 inhabitants, and is the chief commercial town on the coast, exporting considerable quantities of corn, wine, oil, almonds, potash, &c. The environs are fertile. Many ancient tombs and some fine vases have been discovered.

DIRECTIONS.—Port Bari is of difficult access in northerly, and in easterly winds; in the former, the sea washes over the piers. Care must be taken to avoid a rocky bank awash, which breaks in heavy weather; it lies nearly two cables north-eastward from the end of the northern pier. With a northerly wind a vessel should steer for the north extreme of the town, till at a short distance from it, when a course for the pier should be shaped, and, keeping close to it, the anchor should be dropped on having rounded it. With a south-east wind, it is advisable to keep along the southern pier.

Vessels of large draught anchor in 17 fathoms, sand, about one mile off Bari, either with the two conspicuous steeples of the town in line, or with the castle between them. This spot is sheltered from southerly and from westerly winds, but greatly exposed to those from north and from east. Nearer the town, especially between the depths of 10 and 5 fathoms, the bottom is very foul.

The town of Bari is readily distinguished from the eastward by the two steeples above-mentioned, the higher of which is square, of a brown colour, and surmounted by another small steeple. The castle, with its two black towers, will afterwards be seen, and then the high walls of the town.

BARI—NEW PORT, is now being constructed on the north side of the town of Bari. The mole extends in a north-west direction from the most prominent inhabited part of the town, and it has already reached to the distance of 255 yards.* The soundings are 4 fathoms at the extreme point of the mole, decreasing gradually towards the shore. The works completely protect the port from strong E.N.E. winds, but it is imperfectly sheltered from N. and N.W. winds. The entrance lies N.W. of the lighthouse.

LIGHT.—A *fixed red* light is exhibited from a moveable lighthouse placed on the extremity of the mole: it is 21 feet above the sea, and visible at the distance of 5 miles.

* Sicilian Government Notice; January 1860.

LIGHT.—An *intermittent* light of the sixth order stands on the extremity of the jetty, and may be seen in clear weather at the distance of 8 miles.

PORT POLIGNANO.—This small port is fit for boats only; it is 5 miles from Monopoli. The town is on a steep craggy rock surrounded by olive trees, and at the foot of which is a fine spacious cave.

Between Polignano and Monopoli are Orto and Alcina towers; beyond these is St. Paolo rocky islet, on which are the ruins of a monastery. This part of the coast has a fringe of rocks, and is nowhere of safe approach. St. Vito tower, which has a large building to the southward of it, is $1\frac{1}{2}$ mile from Polignano; beyond it is Ripagnola tower on a jutting-out point, and $4\frac{1}{2}$ miles farther is the tower of Mola.

PORT MOLA.—Coasting-vessels anchor both on the east and on the west side of Mola; eastward, in a small harbour, where in a depth of $6\frac{1}{2}$ feet they lie sheltered from northerly winds by a rocky ledge, which extends half a cable south-eastward from the north extreme of the town; and westward of the town, between the castle, and a pier which runs out perpendicularly from the shore. A jetty supported by arches and piles has been built on the rocky ledge above mentioned, which thus greatly protects the port.*

In fine weather vessels anchor in $5\frac{1}{2}$ fathoms, hard mud, about half a mile from the town, which may be recognized by the lighthouse and by two white conical steeples.

The small town stands close to the seaside on a low shore. It is rich, but has little trade; it contains about 8,000 inhabitants.

LIGHT.—An *intermittent* light of the sixth order, stands on the eastern extremity of Mola pier, and is visible in clear weather at about 9 miles.

PORT BARI.—The coast between Mola and Bari, 11 miles distant, is bordered by rocks, and presents no remarkable features, excepting Pelosa and Carnosa towers, and St. Giorgio marsh which communicates with the sea. Although small and shallow, Bari, which is on the south-west side of the town, is the most important port on this part of the coast; it is protected northward by the town walls and by a mole; another mole extending north-eastward from the beach, shelters it on the south-east quarter. The entrance between these piers is open to the eastward, and nearly one cable wide. Inside, the depth is only $6\frac{1}{2}$ feet; the space is sufficient for about 30 vessels, which moor under the north pier with their heads to the eastward, and an anchor laid out in this direction against the heavy sea which occasionally sets in.

* See Plans of Mola and Bari, No. 1,642; scale, $m = 3.5$ inches.

The city, ancient *Barium*, is close to the sea upon a low jutting-out point; it is fortified and well built; is the capital of the province of Bari; contains 19,000 inhabitants, and is the chief commercial town on the coast, exporting considerable quantities of corn, wine, oil, almonds, potash, &c. The environs are fertile. Many ancient tombs and some fine vases have been discovered.

DIRECTIONS.—Port Bari is of difficult access in northerly, and in easterly winds; in the former, the sea washes over the piers. Care must be taken to avoid a rocky bank awash, which breaks in heavy weather; it lies nearly two cables north-eastward from the end of the northern pier. With a northerly wind a vessel should steer for the north extreme of the town, till at a short distance from it, when a course for the pier should be shaped, and, keeping close to it, the anchor should be dropped on having rounded it. With a south-east wind, it is advisable to keep along the southern pier.

Vessels of large draught anchor in 17 fathoms, sand, about one mile off Bari, either with the two conspicuous steeples of the town in line, or with the castle between them. This spot is sheltered from southerly and from westerly winds, but greatly exposed to those from north and from east. Nearer the town, especially between the depths of 10 and 5 fathoms, the bottom is very foul.

The town of Bari is readily distinguished from the eastward by the two steeples above-mentioned, the higher of which is square, of a brown colour, and surmounted by another small steeple. The castle, with its two black towers, will afterwards be seen, and then the high walls of the town.

BARI—NEW PORT, is now being constructed on the north side of the town of Bari. The mole extends in a north-west direction from the most prominent inhabited part of the town, and it has already reached to the distance of 255 yards.* The soundings are 4 fathoms at the extreme point of the mole, decreasing gradually towards the shore. The works completely protect the port from strong E.N.E. winds, but it is imperfectly sheltered from N. and N.W. winds. The entrance lies N.W. of the lighthouse.

LIGHT.—A *fixed red* light is exhibited from a moveable lighthouse placed on the extremity of the mole: it is 21 feet above the sea, and visible at the distance of 5 miles.

* Sicilian Government Notice; January 1860.

LIGHT.—An *intermittent* light of the sixth order stands on the extremity of the jetty, and may be seen in clear weather at the distance of 8 miles.

PORT POLIGNANO.—This small port is fit for boats only; it is 5 miles from Monopoli. The town is on a steep craggy rock surrounded by olive trees, and at the foot of which is a fine spacious cave.

Between Polignano and Monopoli are Orto and Alcina towers; beyond these is St. Paolo rocky islet, on which are the ruins of a monastery. This part of the coast has a fringe of rocks, and is nowhere of safe approach. St. Vito tower, which has a large building to the southward of it, is $1\frac{1}{2}$ mile from Polignano; beyond it is Ripagnola tower on a jutting-out point, and $4\frac{1}{2}$ miles farther is the tower of Mola.

PORT MOLA.—Coasting-vessels anchor both on the east and on the west side of Mola; eastward, in a small harbour, where in a depth of $6\frac{1}{2}$ feet they lie sheltered from northerly winds by a rocky ledge, which extends half a cable south-eastward from the north extreme of the town; and westward of the town, between the castle, and a pier which runs out perpendicularly from the shore. A jetty supported by arches and piles has been built on the rocky ledge above mentioned, which thus greatly protects the port.*

In fine weather vessels anchor in $5\frac{1}{2}$ fathoms, hard mud, about half a mile from the town, which may be recognized by the lighthouse and by two white conical steeples.

The small town stands close to the seaside on a low shore. It is rich, but has little trade; it contains about 8,000 inhabitants.

LIGHT.—An *intermittent* light of the sixth order, stands on the eastern extremity of Mola pier, and is visible in clear weather at about 9 miles.

PORT BARI.—The coast between Mola and Bari, 11 miles distant, is bordered by rocks, and presents no remarkable features, excepting Pelosa and Carnosa towers, and St. Giorgio marsh which communicates with the sea. Although small and shallow, Bari, which is on the south-west side of the town, is the most important port on this part of the coast; it is protected northward by the town walls and by a mole; another mole extending north-eastward from the beach, shelters it on the south-east quarter. The entrance between these piers is open to the eastward, and nearly one cable wide. Inside, the depth is only $6\frac{1}{2}$ feet; the space is sufficient for about 30 vessels, which moor under the north pier with their heads to the eastward, and an anchor laid out in this direction against the heavy sea which occasionally sets in.

* See Plans of Mola and Bari, No. 1,642; scale, $m = 3\frac{1}{2}$ inches.

The city, ancient *Barium*, is close to the sea, upon a low jutting-out point; it is fortified and well built; is the capital of the province of Bari; contains 19,000 inhabitants, and is the chief commercial town on the coast, exporting considerable quantities of corn, wine, oil, almonds, potash, &c. The environs are fertile. Many ancient tombs and some fine vases have been discovered.

DIRECTIONS.—Port Bari is of difficult access in northerly, and in easterly winds; in the former, the sea washes over the piers. Care must be taken to avoid a rocky bank awash, which breaks in heavy weather; it lies nearly two cables north-eastward from the end of the northern pier. With a northerly wind a vessel should steer for the north extreme of the town, till at a short distance from it, when a course for the pier should be shaped, and, keeping close to it, the anchor should be dropped on having rounded it. With a south-east wind, it is advisable to keep along the southern pier.

Vessels of large draught anchor in 17 fathoms, sand, about one mile off Bari, either with the two conspicuous steeples of the town in line, or with the castle between them. This spot is sheltered from southerly and from westerly winds, but greatly exposed to those from north and from east. Nearer the town, especially between the depths of 10 and 5 fathoms, the bottom is very foul.

The town of Bari is readily distinguished from the eastward by the two steeples above-mentioned, the higher of which is square, of a brown colour, and surmounted by another small steeple. The castle, with its two black towers, will afterwards be seen, and then the high walls of the town.

BARI—NEW PORT, is now being constructed on the north side of the town of Bari. The mole extends in a north-west direction from the most prominent inhabited part of the town, and it has already reached to the distance of 255 yards.* The soundings are 4 fathoms at the extreme point of the mole, decreasing gradually towards the shore. The works completely protect the port from strong E.N.E. winds, but it is imperfectly sheltered from N. and N.W. winds. The entrance lies N.W. of the lighthouse.

LIGHT.—A *fixed red* light is exhibited from a moveable lighthouse placed on the extremity of the mole: it is 21 feet above the sea, and visible at the distance of 5 miles.

* Sicilian Government Notice; January 1860.

GIOVENAZZO.—Between Bari and Molfetta, 12 miles distant, the only conspicuous objects are the rocky St. Cataldo point, under the west side of which vessels may anchor ; the small port St. Spirito, with its tower ; and Giovenazzo, a small dilapidated town on a steep cliff, to the westward of which is a creek frequented by coasting-vessels. In fine weather, the anchor may be dropped abreast of Giovenazzo at a moderate distance. The church has two brownish steeples of unequal height.

PORT MOLFETTA.—The port, which is on the west side of the town and formed by a curved pier which protects it from north-east winds, is bordered by quays ; it is sheltered from northerly and from westerly winds by a rocky islet, which lies parallel with, and at about one cable from, the shore ; also by a jetty between the islet and the pier. The depth inside, varies from 1 to 2 fathoms.*

The town, which is of some commercial importance and contains 14,000 inhabitants, stands on the sea shore, and presents an imposing appearance.

LIGHT.—A *fixed* and *flashing* light of the fourth order, showing a flash every three minutes, stands on the west extreme of the west jetty of Molfetta ; it is 64 feet above the sea, and is visible in clear weather at the distance of 14 miles.

DIRECTIONS.—Molfetta town is distinguishable by two steeples, the lower and south-easternmost of which rises little above the houses ; and at a near approach, by two large square buildings in the north-west quarter, which present the appearance of towers. There are two entrances to the port ; one between the town and lighthouse piers, and the other between the lighthouse pier and the rocky islet to the westward of it. The first named entrance should be preferred : mid-channel should be kept in both of them for the sake of deep water.

The **COAST** between Molfetta and Bisceglia, 5 miles distant, is a rugged shore of unsafe approach, and void of shelter even for coasting-vessels. St. Giovanni church, of Greek architecture ; a ruinous Benedictine monastery ; and Caldarina and Paulano towers, form conspicuous landmarks.

PORT BISCEGLIA extends south-westward little more than one cable ; it is sheltered from east and from west winds, with a depth of $2\frac{3}{4}$ fathoms at the entrance, and of 6 to 10 feet in the middle. The entrance, which is between a pier and the shore, is about 130 yards wide. The small craft which use this little port moor to the quays or alongside of the mole, or to a stone pillar near the centre of the port, to the southward of which there is scarcely a depth of 3 feet.*

* See Plans of Molfetta and Bisceglia, No. 1,642 ; scale, $m = 3\cdot5$ inches.

The town of Bisceglia, which skirts the sea-shore, contains 13,000 inhabitants, trades in oil and fruits, and has one or two small establishments for building and repairing coasting-vessels. It is entirely destitute of springs, and rain water only is procurable.

PORT TRANI is $4\frac{1}{2}$ miles westward from Bisceglia; the coast between is precipitous, rocky, and inaccessible even to coasters. The harbour, once important, is almost filled with sand, so that scarcely $6\frac{1}{2}$ feet are found at its entrance, and 3 feet in the middle. The shape is circular; the entrance, 328 feet wide and open to the northward, is formed between two piers which shelter the harbour from every wind. It is only capable of admitting boats drawing about 3 feet water, which moor with warps under shelter of the eastern pier.*

Trani is a handsome town surrounded by lofty walls, is protected by a strong castle, and has a population of 14,000 inhabitants. It may be recognized by a church on an eminence near the centre; also by the castle with three bastions situate at its western extremity.

In fine weather, and with an off-shore wind, vessels anchor off the coast, at about a mile from the harbour, in 7 and 9 fathoms, sandy bottom.

The COAST between Trani and Barletta, $6\frac{1}{2}$ miles to the westward, is low, sandy, and uninhabited; boats may haul up on it.

PORT BARLETTA.—The harbour is north-eastward of the town, between a pier projecting 383 yards in a N. by W. direction from it and a breakwater to the northward; the latter, 273 yards long, is horse-shoe shaped, and affords shelter from northerly winds.*

Vessels moor between the pier and the breakwater in $6\frac{1}{2}$ feet, sand, laying an anchor to the eastward and making fast to the breakwater. They ride here securely with north and north-easterly, but not so well, though without being exposed to any danger, with easterly winds, which raise a heavy surf.

The eastern passage into the harbour is the best. A vessel should not run for this harbour with southerly winds and bad weather, as the sea then breaks on the jetty and breakwater, and renders access dangerous.

The town of Barletta was once splendid and populous, but now presents a ruinous aspect. The streets are well paved; the houses large and lofty; the cathedral is remarkable for its antique granite columns; the citadel is spacious and commands the port. A considerable trade is carried on in salt, prepared near the town in salinas, which render the atmosphere very unwholesome.

* See Plans of Trani and Barletta, No. 1,642; scales, $m = 3.5$ and 2.3 inches.

Supplies.—Provisions of all kinds are plentiful, but the water is ^of bad quality. Vessels of war obtain the latter from the citadel; others from a cistern near the sea entrance. Coasting vessels are built, and every facility for repairs will be found.

LIGHT.—A lighthouse stands on the eastern extremity of the break-water at Barletta, and exhibits a *fixed* white light, 49 feet above the sea, and visible in clear weather at 4 miles.

BARLETTA ROAD.—This road is superior to that of Bari. Anchorage will be found in $5\frac{1}{2}$ fathoms, mud and gravel north-west of Barletta, at three-quarters to $1\frac{1}{2}$ mile from the coast, or farther out in 8 or 9 fathoms, sandy bottom. The vessels which arrive laden with salt generally moor with open hawse to the north-east, the castle in the eastern part of the town in line with the northern angle of the latter. This anchorage is chiefly frequented during the fine season, being very dangerous in winter with the wind on the land.

At night, a vessel should anchor with the lighthouse bearing about S.W., 2 or 3 miles, in a depth of about $6\frac{1}{2}$ fathoms.

Barletta will be recognized by a mountain of considerable height 14 miles S. by E. from the town, and on the summit of which is a castle: it is, moreover, the first town on the coast south-eastward of Gargano head.

OFANTO RIVER.—The land in the vicinity of Barletta is fertile, but beyond this commences a series of low and marshy beaches, which border the Gulf of Manfredonia. At 4 miles from Barletta is the mouth of the Ofanto, the most easterly river of Italy, the deposits from which obstruct all the harbours from Barletta to Otranto. It rises in the Apennines, near the town of St. Angelo de' Lombardi, and disembogues at the boundary of Capitanata and Bari provinces. Fishing-vessels ascend this river when the bar at its mouth is least obstructed.

At 4 miles north-westward of the mouth of the Ofanto are the government salt-marshes of Barletta; they are easily recognized by large storehouses on the sea shore, and off which, in fine weather, vessels anchor at 2 miles from the land in $6\frac{1}{2}$ and 7 fathoms, mud bottom.

LAKE SALPI.—From Barletta salt-marshes to the town of Manfredonia, a distance of about 20 miles, the coast is low, sandy, and intersected by marshes, which render it uninhabitable. The first is Lake Salpi, also called Salapina marsh, a vast sheet of water extending from the salt-marshes of Barletta to the neighbourhood of the mouth of Carapella river, and only separated from the sea by a narrow tongue of sand, at the centre of which stands the Pietre tower. The mouth of the Carapella is indicated by Rivoli tower, on which is a semaphore.

The other lakes, fed by the waters of small streams flowing from the Apennines, and intersected by strips of land on which a few buildings may be seen, are not so large as Salpi. The most important are, the Salso marsh, which communicates with the sea by the same mouth as the Candelaro river: at a mile to the southward of Manfredonia is the St. Antonio canal, the mouth of the marshes of Sipontum; it is opposite the ruins of ancient *Sipontum*, which lie on a hill.

PORT MANFREDONIA.—This small harbour is on the south-west side of a jetty which extends from an angle of the castle: the jetty is in bad condition and does not prevent the sand, washed up by easterly winds, from gradually filling up the harbour, the depth in which does not exceed 7 feet. Strong southerly and south-westerly winds are dangerous and render access difficult.*

The town of Manfredonia, founded in 1250 by King Manfred, occupies a pleasant site at the head of the Gulf of Manfredonia, and at the foot of Mount Gargano; it is surrounded by walls and protected on the north-east side by a strong castle. Owing to its position it is the centre of the trade of the province of Capitanata and the adjoining country; it contains about 6,000 inhabitants, building-yards, an hospital, and store-houses.

Supplies.—Fresh provisions, vegetables, and fish may be procured, as well as water, which may be had at a fountain.

MANFREDONIA ROAD, which lies at the head of the Gulf of Manfredonia, affords the best anchorage on the Italian coast, especially in a heavy bora gale; its position may be recognized by Mount Gargano, the most elevated point on the whole of this part of the coast. Vessels ride safely at about a mile from the shore, in 6 to 7 fathoms, mud bottom, with the town bearing N. W. by N. and Mount St. Angelo N. by E. $\frac{1}{4}$ E.

The best anchorage, for a vessel coming from the westward, and not wishing to stand far in to the gulf, is off Matinata, at 8 miles south-west of the eastern extremity of Gargano head, abreast a tower and some houses, which will be seen on the slopes of the mountains, and in the midst of cultivated lands. Care should be taken to anchor in $5\frac{1}{2}$ to 6 fathoms, muddy bottom; the ground being rocky farther out.

There is also anchorage off any part of the coast between Matinata and Manfredonia, taking care not to come to in more than 8 fathoms water, at not a greater distance than a mile from the land. Should the violence of the wind compel a vessel to bring up farther off, the anchor

* See Plan of Manfredonia, No. 1,642; scale, $m = 2\cdot8$ inches.

should be dropped within 3 miles of the land, and to the southward of *Matinata*, where 7 to 8 fathoms, mud bottom and good-holding ground, would still be found; this anchorage is used by vessels of war.

When lying at anchor at the head of the Gulf of Manfredonia, the bora wind, called *Monterese* by the inhabitants, should be expected; it rushes down in violent squalls from the gorges of Mount Gargano.

Manfredonia road is exposed to winds between south-south-east and north-north-east; but whatever its violence in the offing the wind very seldom blows strong near the land, and the sea is never very heavy at the anchorage. A south-westerly wind will sometimes blow at the anchorage in violent squalls, but not for any length of time: it blows lightly almost every night, veers to the westward at daybreak, and remains in that quarter during the greater part of the forenoon.*

DIRECTIONS.—Mount Gargano is lofty and isolated, and a useful guide for the anchorage in Manfredonia road from whatever quarter it be approached. It is the first high land seen on the coast of Italy in coming from the Mediterranean; Mount Calvo, its most elevated peak, is 3,490 feet above the level of the sea, and Mount St. Angelo, 2,400 feet; on the summit of the latter are a tower with a semaphore, and a church.

In running from the westward with a bora wind for the anchorage in Manfredonia road, the eastern point of Gargano head should be rounded at a short distance, taking care of the violent gusts from the high land. If the wind be north-westerly outside, it will in summer generally be found about E.N.E., after passing the head; in winter, on the contrary, it hauls to the westward and comes down in violent squalls from Gargano. In such a case, a vessel will be obliged to tack, keeping the land close aboard, except in the vicinity of the mouths of Candelaro river to the southward of Manfredonia, where the water shoals to at least a mile in the offing.

GARGANO HEAD.—Between Manfredonia and the Testa del Gargano the coast is every where elevated and inaccessible. The eastern part of Mount Gargano projects considerably to the eastward, presenting a face 11 miles in breadth. The coast is very high, and perpendicular towards the sea, and may be approached within a short distance; the head is the most easterly projection; it is high, and steep towards the sea, and has a white tower on its summit. To the southward of the head will be seen Campi and Guardia towers, between which are the small Campi and Greco harbours; to the northward, between the head and Viesti, are the tower of Gattarella point, and the two small anchorages St. Felice

* A rock is marked in the chart at about three-quarters of a mile off shore, between Manfredonia and *Matinata*.

and Portonovo; the latter, which is to the northward of the town, is a rather large harbour sheltered by a rock bearing the same name. To the eastward of Viesti is the low and open beach of Ponte, where vessels may anchor temporarily in $5\frac{1}{2}$ to $6\frac{1}{2}$ fathoms, hard mud. This anchorage, which is well sheltered from north-westerly and westerly winds, may be used by vessels running from a storm from that quarter; but the anchor should be weighed immediately the wind begins to abate.

PORT VIESTI, nearly 4 miles to the northward of Gargano head, is between two projecting points of land; St^a Croce rock protecting it in some measure from the north-east. The harbour is small, has only 7 feet water, and is exposed from east to north-west; the currents run with great strength, and render the southern entrance difficult. Coasting-vessels, by which alone Viesti is visited, make fast to the rock.*

The small town of Viesti stands on a rocky point close to the sea, and at the foot of the summit of Mount Gargano. It is built in the shape of an amphitheatre, and may be recognized by its isolated position; by a fort, on which is a semaphore; by a steeple which overlooks the town; and on the north by St^a Croce tower. Supplies can be obtained, and there is a cistern of water

The COAST, from the northern extreme of Port Viesti, bends round north-westward to the town of Peschici, and, although there are a few small sandy beaches, it is generally steep and winding and of difficult access even to fishing-boats. The most conspicuous objects on it are, Molinello and Porticello towers; Cianca islet, joined to the island by rocks; Spinale tower; Paradiso rock, inside which is a depth of $2\frac{1}{2}$ fathoms; and the projecting point on which stands the tower of Calalonga. The land may be approached to the distance of a mile, bearing in mind that the current sets towards it, and that there is no anchorage for large vessels.

PESCHICI, at 9 miles from Viesti, is a small village built in a picturesque situation, on an elevation perpendicular towards the sea. There is anchorage for coasters in $2\frac{3}{4}$ to 3 fathoms, mud bottom, to the westward of the village, but it is bad. They anchor between a group of rocks and off Pucci, or Poccio, tower.

RODI.—At 6 miles to the westward of Peschici is the town of Rodi, on an advanced and precipitous hillock; it occupies a beautiful position amidst gardens and olive trees.

* See Plan of Viesti, No. 1,642; scale, $m = 3$ inches.

The pier, which protected the small harbour of Rodi against northerly winds, has been destroyed by the sea. Coasting-vessels, which come for the produce of the town, generally anchor at a quarter of a mile off shore, mooring with open hawse to the northward; it is not a good anchorage. The town will be recognized by Ischitella church steeple, situate on an eminence above it.

Supplies.—Provisions and water may be had in abundance, as well as oranges, lemons, almonds, &c., in which a great trade is carried on. Ship-building timber is supplied from the forests of Gargano.

ANCHORAGE.—Vessels of large draught may anchor between Peschici and Rodi, at $1\frac{1}{2}$ mile from the coast, in $8\frac{1}{2}$ to 12 fathoms water, sheltered from a south-easterly gale, and from all off-shore winds. This anchorage may be useful to a vessel bound out of the Adriatic, which, overtaken by a strong south-east wind, is unable to round Gargano head in order to find shelter in Manfredonia road; but it should be abandoned at the slightest symptoms of a sea breeze.

TREMITI ISLANDS and PORT.—Tremi islands, so called from frequency of earthquakes, and situated 20 miles north-west of Rodi, are four in number, almost uncultivated, and produce nothing but a little oil and firewood. They are low and scarcely visible in fine weather at 10 or 12 miles. The only water is in the well of a fortress on the south-west end of St. Nicola island. Their shores, and especially the northern, are generally steep and inaccessible; the soundings around them are deep, varying from 17 to 35 fathoms.*

St. Domino, the largest, and the south-west island of the group, is $1\frac{1}{2}$ mile long, and about three-quarters of a mile broad. It is a little more elevated than the others, a hill rising at its south-western part.

Cretaccio island, the smallest of the group, is a square rock, half a mile in circumference, lying three-quarters of a cable from the north-east point of St. Domino. St. Nicola, the eastern island of the group, is a steep rock about a mile long; at its south-west extremity is a fortress; on the north-east point is a cemetery. Caprara, the north-east island of the group, also called Capperara on account of the great quantity of caper trees which grow on it, is a steep, arid rock, lying north of St. Nicola, from which it is separated by a channel, $2\frac{1}{4}$ cables wide, with a depth of 7 to 9 fathoms.

The small space between St. Domino, Cretaccio, and St. Nicola islands is called the harbour of Tremi islands. It has an area of only $2\frac{1}{4}$ cables but is well sheltered from all winds, has a depth of 2 to 3 fathoms, and

* See Plan of the Tremi islands, No. 1,500; scale, $m = 2.4$ inches.

will afford space to about twenty small vessels. They generally anchor between St. Nicola castle and St. Domino, mooring to posts on Cretaccio. Vessels also anchor between Cretaccio and St. Domino, and run a hawser out to each island. Pilots prefer the latter anchorage, because it affords greater security against the bora, and from the swell from the southward which is very inconvenient at the other anchorages.

ANCHORAGE.—The anchorage off Tremiti islands is sufficiently well sheltered from a bora gale, and is also well situated for vessels which, having got too far to the westward, find it impossible to round Gargano head in order to make Manfredonia road. A vessel of large draught should in such a case anchor off the south-east coast of St. Domino, at about a third of a mile from the shore, in 17 to 35 fathoms, mud bottom, good holding-ground. The nearer a vessel approaches the south-west part of St. Nicola, the better she will be sheltered from the bora; vessels may anchor sufficiently near St. Nicola to be able to make fast to some strong posts under the fort.

Coasters sometimes seek shelter from south-east gales in a small creek, Cala de' Turchi, on the west side of Caprara island.

DIRECTIONS.—Vessels running for the harbour of Tremiti islands pass either between St. Domino and Cretaccio, or between the latter and St. Nicola. The former channel is clean, three-quarters of a cable wide, and has a depth of 4 fathoms; the other is $1\frac{1}{2}$ cable wide, with a depth of $4\frac{1}{2}$ fathoms.* In using the latter, care must be taken to avoid the Vecchia rock awash, which lies off the north-east end of Cretaccio. There is also a channel between St. Domino and St. Nicola; in using it, a good berth should be given to the two islands in order to avoid some rocks awash, lying near them. For a small vessel, seeking shelter, the two other channels, the eastern especially, are the best.†

In coming from the northward, vessels will have to avoid a rocky bank lying between the south-west point of Caprara island and Cretaccio, at nearly $2\frac{1}{2}$ cables north-east of the latter, and on which there is only a depth of 2 fathoms.

PIANOSA ISLE, lying E. by N. $\frac{3}{4}$ N. $11\frac{1}{2}$ miles from the north-east extreme of Tremiti islands, is a low, flat, arid rock, very much depressed towards the south, but rising a little on the north. It is nearly 4 cables long, and about $1\frac{1}{2}$ cable broad; the north side may be approached to

* In the Plan of these islands, by Capt. W. H. Smyth, R.N., in 1818, the general depths marked in these channels are 2 and $2\frac{1}{2}$ fathoms.

† Cavalcanti, in p. 108, says that the islands of St. Domino, Cretaccio, and St. Nicola have been recently connected by bridges, which would necessitate the use of the southern pass.

half a cable ; the south side is foul and a berth of at least 2 cables should be given to it. This rock is only 50 feet above the level of the sea ; the currents in its locality are rapid, and of uncertain direction ; it should, therefore, be avoided in any weather.

PELAGOSA ISLES, two in number, Grande and Piccola, lie nearly in the middle of the Adriatic, about 25 miles E. by N. from Pianosa. Like the latter, Pelagosa Grande is an uncultivated rock rising perpendicularly towards the south, and less steep on the north ; it is about two-thirds of a mile long, and not more than a cable broad. Rocks level with the water extend upwards of a cable from its western point. Pelagosa Piccola is off the eastern end of the larger isle, to which it is almost joined by shoals ; it is about $1\frac{1}{2}$ cable long, and surrounded by shoals to the distance of more than a cable.*

Pelagosa Grande is 150 feet above the level of the sea ; its situation in the middle of the Adriatic and about mid-way between Gargano and Lagosta, renders it a good point of departure to vessels navigating the Adriatic during the fine season. They should, however, always avoid approaching it closely, especially at night or in thick weather, on account of the currents, which are very irregular in its vicinity.

CAIOLA ROCK lies S.E. by E. $\frac{3}{4}$ E. $3\frac{1}{2}$ miles from Pelagosa Piccola ; it is awash, and hardly a cable long. To the eastward of Caiola is Pampano bank, a narrow rocky ledge, about two-thirds of a mile long, and in the centre of which some breakers are visible. It would be imprudent, on account of the currents, to try to pass between Pelagosa, and Caiola, although the channel is wide and deep.

ASPECT of COAST. — Beyond Rodi commences a long, uniform, sandy beach, which extends almost uninterruptedly for about 150 miles, as far as mount Conero. From Rodi to the mouth of Tronto river, although the coast is not very populous, and only cultivated in the vicinity of towns, provisions may be obtained in abundance, especially fresh, water, which is everywhere supplied by numerous torrents descending from the Apennines ; but there is not a single harbour wherein a vessel may obtain shelter. The water shoals for about a third of a mile from the shore, over a bottom of sand or gravel ; farther off the bottom is mud, except between Termoli and Vasti, where, at 2 miles from the land, is a rocky bank running for half a mile parallel with the coast.

* See Plan of Pianosa and Pelagosa isles, No. 1,500 ; scale, $m = 2\cdot4$ inches.

The whole of this portion of the Italian coast may, in fine weather, be ranged along at the distance of a mile, with depths of at least $5\frac{1}{2}$ fathoms, and vessels may, with off-shore winds, anchor at 2 miles in the offing, in good holding-ground or, in fine weather, even with south-easterly winds. The following is a brief description of the principal anchoring-places of coasters.

Mileto Point.—At 10 miles from Rodi is Capoiale point, to the westward of which stands Calaroscia tower, and close to the westward of this tower is Mileto point. The coast which unites these two points is rocky, of some height, and precipitous. Mileto point, on which is a telegraph, is remarkable for its projection to the northward between two long sandy beaches, and as terminating a chain of eminences separating the two great lakes of Varano on the east and Lesina on the west.

Varano and Lesina Lakes.—These lakes, which are only separated from the sea by a low, narrow tongue of sand, overgrown by a forest of beech and oak trees, communicate with each other by two small channels, inaccessible even to fishing-boats. The only trade carried on in the neighbouring villages and in the town of Lesina, situated at the most westerly extremity of the lake, is in fish, with which the lakes abound.

FORTORE RIVER, the ancient *Frento*, or *Frentone*, rises in the woods of Mazzocco, at Mount Chilone, and its mouth, which is 14 miles to the eastward of Mileto point, and in close proximity to Pietre Nere point, may be recognized by a large storehouse of tower-shape. Small craft drawing about 4 feet can ascend it, when the position of the banks which it forms at its mouth leaves the pass free.

ANCHORAGE.—Vessels anchor at $1\frac{1}{2}$ mile from the shore, north of the mouth of Fortore, in about 11 fathoms, sandy bottom, the storehouse at the mouth of the river bearing N. by E. This, however, is a bad anchorage, with north-east and northerly winds, as they raise a heavy sea, and accelerate the currents; but it affords tolerable shelter against easterly and south-easterly winds, an advantage not possessed by any of the anchorages to the westward as far as Ancona. The position will be recognized by a large tower-shaped storehouse on the beach, in which the produce of the interior, particularly the corn destined for exportation, is deposited. Coasters obliged to remain any length of time at this anchorage, moor their vessels securely, the crews going on shore at sunset to avoid being wrecked in them, in the event of a heavy bora.

CAMPO MARINO.—From the mouth of the Fortore the coast is low, and almost entirely covered with the woods of St^a Agata, Maresca, and Romitello; the only remarkable objects being the towers of Mozza and

Saccione (the latter at the mouth of a river of the same name), and then the tower and village of Campomarino, situated on an elevation near the shore, and surrounded by a fertile plain. Campomarino is at the mouth of a small river, the Biferno, which has its source at the foot of the mountains of that name near Boiano, and disembogues at the sea in the midst of marshes and sandy lands; fishing boats are able to ascend it when the waters are swollen.

ANCHORAGE.—Vessels may anchor off Mozza tower in 10 to 4 fathoms, north-eastward of a large mountain inland, which will be seen between Mounts Lesina and Termoli. There is also an anchorage off Campomarino in 5 and 6 fathoms, at a good distance from the land, the same precautions being required as at Fortore.

TERMOLI town stands on a projecting rocky point, at $2\frac{1}{2}$ miles to the north-west of Campomarino; it is small, fortified, and contains about 2,000 inhabitants. Provisions and water are easily obtained.

ANCHORAGE.—Vessels anchor off Termoli, northward or north-eastward of the town, at 2 miles, in $8\frac{1}{2}$ to 12 fathoms, mud bottom, with the town in line with a mountain inland. A good position is with the town bearing N.W. by W. $\frac{3}{4}$ W., and Campomarino village S.S.W. $\frac{1}{2}$ W.; this anchorage is, however, very inconvenient with easterly, south-easterly, and northerly winds, and vessels should stand out into the offing if the wind arise from one of these quarters.

The coast from Termoli bends round to north-by-west and north for 16 miles to Penna point, and is wooded and desert, with the exception of the town of Vasto, at the head of the bend; but being low, and bordered by a sandy beach as far as Vasto, coasting-boats are enabled to approach it and haul on shore in case of need. The interior of the country is high and mountainous. Numerous rivers and torrents discharge their water into the sea between Termoli and Vasto, and some rocks lie near the land. The Trigno, the position of which is shown by Montebello tower, is the only important river, being navigable for small craft when the banks at its mouth will admit of their crossing the bar.

PETACCIATO.—The bank and anchorage of Petacciato lie S.E. by S. 8 miles from Vasto. The bank is a rocky shoal, 2 miles from the coast to which it runs parallel; it is half a mile long, and has a depth of 11 fathoms; vessels anchor in $5\frac{1}{2}$ and 7 fathoms, good holding-ground, between it and the shore. This is a tolerable anchorage with the wind on shore, the sea being broken before it reaches it; when running for it, a vessel should steer for the land midway between Termoli and Penna point, toward a large wood, anchoring directly the bank has been crossed.

VASTO.—This town is on a hillock of some height at the head of the bend made by the coast between Termoli and Penna point; it is fortified, and has a population of about 8,000 persons; the neighbourhood is well cultivated.

Supplies.—Water and provisions are in abundance.

ANCHORAGE.—Vessels anchor in 11 fathoms, mud bottom, good holding-ground, at about 3 miles north-eastward of the town; they generally moor with open hawse to eastward, and by backing their anchors are able to hold on with a strong breeze from east or east-north-east, if unable to get under way. Small coasters anchor nearer the town, at about a mile from the coast.

PENNA POINT.—The coast between Vasto and Penna point is rocky high, and inaccessible, on account of the rocks by which it is bordered. The point itself is composed of dark rocks, and is easily distinguished by its north-east projection; also by a semaphore tower on its most elevated point, and by a large building a little inland.

SANGRO RIVER.—From Penna point to the mouth of Sangro river the shore is sandy, and with the exception of Adercio rocks near the tower at a mile to the westward of the point, is everywhere accessible. Amongst the numerous torrents which reach the sea on this portion of coast, the Sangro is the only one of any importance. It takes its rise in the mountains near lake Celano, and falls into the sea at Turino wood, 8 miles westward of Penna point; a tower on the left bank marks its mouth. It is navigable for small craft when banks do not obstruct the entrance.

To the westward of the Sangro, as far as the tower at the mouth of Feldrino river, and at the small village of St. Vito, the coast is everywhere bordered by rocks; but between the latter and Ortona, where two rivers which rise at the foot of Mount Maiella reach the sea, it becomes low and accessible. St. Vito village stands almost at the margin of the sea, between two well cultivated hillocks.

PORT ORTONA.—The small harbour of Ortona, in a bay on the eastern side of the town, is formed by a pier 330 feet long, which shelters it from northerly winds. The depth is only about 12 feet, sandy bottom; it is therefore only available to small craft, which moor to the southward of the pier. The point on which the town stands runs out for about 650 feet, and is surrounded by rocks. There is an indifferent anchorage at a mile from the land, eastward of the town.*

The town of Ortona is on a promontory jutting out north-eastward

* See Chart:—Adriatic Sea, Fossaceca to Rimini, No. 200; scale, $m = 0.18$ inch, and Plan of Port Ortona, &c., No. 1,678; scale, $m = 6.6$ inches.

at 16 miles north-westward of Penna point. Its position may be easily recognized from sea by the high Maiella mountain, the summit of which, 7,496 feet high, is an enormous round mass 18 miles south-westward of the town, and the church steeple of Chieti and the various buildings of Ortona will be seen on nearing the coast. The town is surrounded by walls, and contains many large buildings; its population, chiefly fishermen, is about 7,000. The environs are well cultivated. Provisions and cistern water are easily obtained.

FRANCAVILLA.—About 7 miles north-westward of Ortona is Francavilla, a somewhat remarkable village, of 2,600 inhabitants; it is near the margin of the sea, on a small eminence surrounded by well cultivated lands. The shore between the towns is low and sandy, the only remarkable objects being the tower of Mucchia, and those at the mouths of Ariello and Foro rivers.

PESCARA PORT and TOWN.—The channel of Pescara river serves as its harbour, and divides the town into two parts; it is much frequented by coasters, which carry on the trade of the Abruzzi provinces, and is the safest harbour on the coast. It has a depth of $6\frac{1}{2}$ feet, but can only contain about 30 small vessels, which make fast to posts on the banks.

The town of Pescara is 4 miles from Francavilla, and stands in a plain on the banks of Pescara river; it is strongly fortified, and contains a population of about 2,000 persons.

Supplies.—Provisions are in abundance, but the water is bad. Boats are built for the coasting-trade.

Pescara river, which separates the two Abruzzi, has its source in the mountains which surround the town of Aquila, winds round the Gran Sasso d'Italia, passes Chieti, and falls into the sea, after flowing through the town of Pescara.

ANCHORAGE.—There is an anchorage at $1\frac{1}{2}$ mile from the mouth of Pescara river in 8 to 11 fathoms, mud bottom, the tower at the mouth of the river bearing W.S.W.; the ground being good, vessels ride here with winds from the offing.

DIRECTIONS.—The position of Pescara and the whole of this part of the coast is easily distinguished by Mount Corno, called also the Gran Sasso d'Italia, which is 25 miles westward from Pescara; it is the highest elevation in the neighbourhood—about 9,840 feet,—and may be recognized by its summit, which is divided into two pyramidal peaks of similar shape.

When bound to Pescara, vessels steer midway between Mounts Maiella

and Corno, until able to distinguish the fortress of Pescara, which is very low, and visible at a short distance only from the land.

THE COAST.—From Pescara, to the westward of which is a large pine forest, to the Tronto, which forms the Neapolitan frontier, 30 miles distant, the coast is low and sandy, and thinly inhabited, owing to the unhealthiness of its marshes. The remarkable objects are the village and castle of Silvi, on an eminence, 8 miles from Pescara; Cerano tower; the steeple of Atri church, 1,600 feet above the sea; the inland town of Mutignano; Mount Pagano, on the summit of which is a building; the village of Giulianova, on an eminence one mile from the mouth of Tordino or Trontino river; and the town of Tortoreto on an elevated hillock between Giulianova and the Tronto.

This coast is intersected by seven rivers; the Salino Maggiore, the Piomba, the Calvano, the Vomano, the Tordino, the Salinello, and the Vibrata. These are of little importance, and, with the exception of the Salino Maggiore and the Vomano, which fishermen occasionally ascend, they all become dry in summer; each of them gives rise to an accumulation of detritus at its mouth.

ANCHORAGE.—In fine weather, vessels anchor at $1\frac{1}{2}$ mile from any part of this coast in $5\frac{1}{2}$ fathoms, mud bottom, and may safely range along it at that distance unless the wind blow right on to the shore.

Boats engaged in the export trade of the coast anchor off the shore abreast Silvi and Giulianova villages, hauling on shore in case of need, except at Cerano tower, in front of which are some rocks awash.

TRONTO RIVER rises at the foot of the Sibilla mountains, flows to the east of Ascoli, and falls into the sea between two towers. There is scarcely a depth of 3 feet at its mouth at high-water, at which period coasters ascend it for about half-a-mile, passing with difficulty between the banks by which it is obstructed. The town of Colonella stands on a high mountain 3 miles south-westward from the mouth of the Tronto, and is a good mark to distinguish its position.

CHAPTER IV.

WESTERN COAST.—TRONTO RIVER TO PO DI GORO.

VARIATION, $13\frac{1}{2}^{\circ}$ to 14° West, in 1861.

THE COAST.—From Tronto river to the mouth of the Po di Goro, is a distance of about 150 miles. This portion of the coast comprises the shores of six provinces, viz., the Marches of Fermo and Ancona, and the Legations of Urbino, Pesaro, Romagna, and Ferrara.*

The 45 miles of coast between the Tronto and Ancona are generally low and sandy; hillocks occur at long intervals, in continuation of the Apennines, but do not reach within half a mile of the shore excepting between Marano and Fermo, where the shore is very steep. These elevations form a pleasing contrast with the beach, being well cultivated and covered with towns and villages.

At Rimino the coast suddenly becomes uniformly low and sandy, and continues so to Maestra point; between Rimino and Cervia, towns and villages are visible in the midst of a vast and cultivated plain; but beyond the latter the coast is intersected by marshes, and inland appears the largest pine forest of Italy, extending from Ravenna to Primaro.

The rivers and numerous streams which flow to the sea on the Romagna and Ferrara shores bring down a great quantity of soil, causing an extension seaward. The banks thus formed vary so often in shape, and extend so far into the offing, that it would be dangerous for a vessel of large draught to approach the shore nearer than 8 or 10 miles between Maestra point and Pesaro, or than 6 or 7 miles between Pesaro and Ancona; a depth of $5\frac{1}{2}$ fathoms will be found between Sinigaglia and Pesaro at $1\frac{1}{2}$ mile, and of $3\frac{1}{2}$ fathoms between Pesaro, and Maestra point. Nearer the shore, and particularly at the mouths of rivers and torrents, are banks of sand extending half, and three-quarters of, a mile in the offing; on the other hand, wherever the land is high, rocks will be found to border the shore, and to render it of difficult access, even to boats.

ANCHORAGES.—Small vessels may anchor off any part of the coast between Tronto river and the mouth of the Po di Goro, at a distance of half-a-mile, especially in front of the towns and villages. Vessels of large draught, in case of need, may anchor about 3 miles off, where good holding-ground of hard mud will be found. Between Mount Conero

* See Admiralty Chart, Adriatic Sea, Fossaceca to Rimino, No. 200; scale, $m=0.18$ inch.

and the Tronto the anchorages are only good with off-shore winds or in fine weather. It should be particularly borne in mind that, on coming to an anchor by night or in foggy weather along this portion of the coast of Italy, the lead should be kept going, care being taken not to stand in to a less depth than 9 to 12 fathoms.

Under Ancona, and as far as Sirolo, the coast is high and perpendicular, with deep water close to, and vessels should not anchor off it except in cases of absolute necessity. Beyond Ancona, as far as Rimini, the high lands of the Apennines decline to within about half a mile of the coast, and in some places, as at Ancona and Pesaro, meet the sea.

Off the coast between Ancona and Maestra point, in addition to the precaution of anchoring at a distance of not less than 8 or 10 miles from the shore, in a vessel of large draught, it will be necessary to ascertain by the lead the quality of the bottom, for anchors frequently drag, particularly between Rimini and Maestra point, on account of the great hardness of the clay. Small vessels anchor $1\frac{1}{2}$ mile from the coast, between Maestra point and Cesenatico, and still nearer between the latter town and Ancona; but all these anchorages, though good with off-shore winds, are dangerous with others, and care should be taken not to be surprised, at them.

From TRONTO RIVER to MAESTRA POINT, Ancona is the only place which deserves the name of harbour, and which is capable of admitting vessels of large tonnage. All the rest, formed chiefly by mouths of rivers, are scarcely available to coasters, and are, moreover, of difficult access. The following is a brief description of them:—

St. Benedetto is a village partly situated on a hillock near the sea, 3 miles northward from the mouth of the Tronto.

Grottamare.—At 3 miles farther to the northward is the village of Grottamare, on the slope of a small hill, at the foot of which stands another village; the latter may be recognized at some distance by the tall belfry of a convent. The mouth of the Tesino, a small river of no importance, lies between Grottamare and St. Benedetto.

Marano.—At 2 miles to the northward of Grottamare is Marano, another village built on the summit of a small elevation not far from the sea.

These three villages, off which coasters anchor, are very populous; they carry on a considerable inland trade. The coast between Tronto river and Marano is of difficult access, being bordered to half a mile seaward by banks of sand, and in some places by breakers, which will not allow even boats to approach, except in fine weather. It may be recognized when standing in by Mount Sibilla, which rises inland, about 27 miles westward from Grottamare. This mount forms a part of the Apennine chain, and i

easily distinguished by its arid summit, and by several whitish peaks at a short distance from each other.

Supplies.—Water and provisions may be procured at the villages, where coasting-vessels are built.

Pedaso.—This small village, 5 miles to the northward of Marano and on the right bank of the mouth of Aso or Asone river, is another point of some commercial importance. The river, off which coasters anchor, rises at the foot of the Sibilla mountains; it is capable of receiving small vessels in fine weather, and when the sand-banks formed at its mouth permit.

Port Fermo.—The town of Fermo, which may be recognized by a remarkable dome, is on an eminence 6 miles from Pedaso and 4 miles from the sea. Vessels anchor off the coast before a small village eastward of the town; the beach on which the village stands is lower than any other part; like the rest, it is only approachable in very fine weather, on account of the banks bordering it, which, in some places, extend one mile from the shore.

The Lete, a small river of no importance, disembogues one mile southward from Port Fermo, between it and the small village of Palma, which is on elevated land to the southward. At 4 miles from Port Fermo flows the Tenna, a small river accessible to boats occasionally in winter. This river, taking its source in Sibilla mountains, is very rapid in spring and autumn, when the mud brought down by it is carried out to a considerable distance.

Port St. Elpidio.—The village of St. Elpidio is 2 miles to the northward of the mouth of the Tenna. A castle stands on a high hillock 3 miles westward of the village, which is a good mark in making the land. Coasters anchor off some large storehouses on the beach.

Chienti River.—This small river, which separates the March of Fermo from that of Ancona, takes its rise in the Apennines, flows past Tolentino and Macerata, and after a course of 58 miles issues between St. Elpidio and Civitanova. Fishing-boats navigate its mouth at high-water.

Port Civitanova.—Civitanova is a small village on the shore, 3 miles eastward from the town of this name, which stands on a high hillock inland, and occupies the site of the ancient *Novana*. The anchorage off the village is much frequented on account of the central position of Civitanova, in the midst of a rich, populous, and well-cultivated country.

Supplies.—Provisions and water are to be obtained. Coasting vessels are built here.

Port Monte Santo.—At 3 miles to the northward of Civitanova is the castle of Monte Santo, on an elevated hillock $3\frac{1}{2}$ miles from the beach. Vessels anchor off a small village close to the shore, eastward of the castle, and on the left bank of the mouth of the Asola, a small river rendered impracticable by mud-banks at its entrance.

Port Recanati.—On the beach, $4\frac{1}{2}$ miles from Monte Santo, stands a village, called Recanati, after a large town to which it serves as port. Coasters anchor off some large storehouses at the village, where they can haul on shore if necessary. The dome and tower of Loreto, on an eminence, $2\frac{1}{2}$ miles westward from Recanati, mark the position of this anchorage.

Two unimportant rivers, the Potenza and Musone, issue near Recanati; the former at 1 mile to the southward and the latter at $2\frac{1}{2}$ miles to the northward.

Umana and Sirolo.—At 5 miles from Recanati, and in the bight formed by the coast in trending to the northward, are Umana and Sirolo, villages on the eastern slope of Mount Conero. Sirolo is on an elevated hillock near the sea; vessels may, in case of need, anchor off it in $6\frac{1}{2}$ fathoms mud, and will be sheltered from gales between north, and west, by the mount.

MOUNT CONERO.—The coast changes suddenly in aspect at Sirolo where it rises and forms the great elevation known as Mount Conero, or Mount Ancona.

Mount Conero is the most striking headland for many miles on this part of the coast; it rises almost perpendicularly from Mezzaluna point, at about 7 miles from Ancona lighthouse, and presents a front of seven miles from north-west to south-east. On its south-east extremity, which is the most elevated, being 2,165 feet high, stands an isolated telegraph tower, which serves to mark the mount at a great distance, from whatever quarter it be approached; a convent is half a mile south-eastward of the tower. The mountain becomes gradually depressed on the north-west, where it terminates in a truncated conical hillock, on which are numerous edifices, and a church.

Anchorage.—A vessel overtaken by a south-westerly gale, and finding it impossible to carry canvas, may seek temporary shelter on the north-east side of Mount Conero; the anchor should be dropped at about a quarter of a mile from the land, where there is good holding-ground; she should, however, weigh when the wind, which does not generally last long, commences to abate.

PORTO NUOVO lies $2\frac{1}{2}$ miles north-westward from Mezzaluna point. This little harbour affords a safe shelter to fishing and quarry boats when prevented by the violence of the wind from reaching Ancona. It is protected from northerly winds by a ledge of rocks, named *Il Trave*, which extend about a mile south-eastward from its north-west point; some of these are awash, but mooring posts show their position. The entrance is between the eastern extremity of the ledge and Batteria point, off which

are some dangerous rocks. The general depths in the harbour are 4 and 5 fathoms, gravel bottom. Vessels are well sheltered from all winds, except those between north and south-east, which will, however, always admit of their proceeding to Ancona.*

As this harbour is mostly frequented with winds from the westward, it will be well to remember on approaching the land, that, from this quarter, they rush down with such force as to produce dangerous squalls.

ST. CLEMENTE ROCKS.—Between Porto Nuovo and the western extremity of Mount Conero are some rocks awash, which should be carefully avoided by a vessel working along the coast, when standing close into the land under Mounts della Croce and Padrone; and a ledge, called St. Clemente rocks, lies off Ancona point, at the foot of Mount Guasco, on which stands the chapel of St. Ciriaco. There is no passage between these rocks and the point, and it will be prudent at all times to give them a wide berth as the current sets strongly in their neighbourhood. They lie N.E. by E. half a mile from Ancona mole light-house, and nearly a cable from the point; they are surrounded on the south-east and north-west sides by rocky banks awash; on the north-western bank, called Volpe, is a beacon 23 feet high. The depth north-westward of the beacon is about 2 fathoms.

PORT ANCONA, 6 miles westward of Mount Conero, is the only harbour in this part of the Adriatic, which is sufficiently capacious to receive vessels of large tonnage, up to 24 feet draught of water.† It is formed by a jetty and a breakwater, with an entrance about 4 cables wide; the eastern part is bordered by quays and walls. The north jetty projects 700 yards to the westward from the northern point of the harbour; it is 33 yards wide, and has a battery and lighthouse at its end; the south breakwater shelters the harbour from westerly and south-westerly winds.‡ A considerable sea is thrown in by winds from the westward, and it is customary for vessels to lay out a backed anchor.

Abreast of the southern bastion of the town, lies a bank of rocks, which extends about $2\frac{1}{2}$ cables towards the south jetty; a depth of $6\frac{1}{2}$ to 10 feet will be found over every part of it, except at a small stone pillar which has been erected to show a depth of less than 2 feet; on this bank have been recently built three piers running parallel to each other

* See Plan of Porto Nuovo, No. 1,678; scale, $m = 1\frac{1}{4}$ inch.

† See Plan of Ancona, No. 1,880; scale, $m = 18$ inches.

‡ In September 1814 a gale from West to S.W. showed that the scogliera or south breakwater did not protect the harbour as completely as had been expected. Several vessels were seriously damaged, and the harbour was encumbered with mud in every part. However, the silting up of the harbour has decreased considerably since the construction of the breakwater.

and to the south jetty; they extend from the bastion to the depth of $2\frac{3}{4}$ fathoms, having between them and the south jetty a channel 164 feet wide leading to the lazaretto. Everywhere else the bottom of the harbour is of black soft mud, but not sufficiently good to obviate the necessity of backing the anchors or making fast to the pillars on the shore or in the middle of the harbour. The depth varies greatly; a dredging-machine is constantly at work to prevent accumulation of mud.

There is room in the port within the lighthouse for two or three large vessels moored with their heads to the southward, an anchor being laid out to the westward, another to the southward, and two stern cables to the pier.* Farther in and along the latter, vessels of less draught may moor between the old pier and the lighthouse. Merchant-vessels go alongside the town quays, making fast to posts placed there for the purpose. It should be remembered that four of these posts are reserved for vessels in quarantine.

ANCONA TOWN, built on the slope of a hill remarkable for the whitish appearance of its soil, lies between two promontories; on the southernmost, Mount Astagno, stands the citadel, which commands the town and harbour; on the other, Mount Guasco, is the church of St. Ciriaco. The town is ancient and well fortified; and its arsenal is well furnished and important; it contains about 36,000 inhabitants, and has almost the whole of the commerce of this part of the Adriatic. A considerable trade is carried on in grain, silk, and wool, and a great quantity of every kind of rope is manufactured for ships' use. In 1857 the arrivals were 684 vessels of 110,704 tons.

On the north mole is one of the finest remains of antiquity, the triumphal arch erected by Trajan, A.D. 112. Provisions are in abundance, and water may be had at the lazaretto, or at the town fountains; these are approached by the south gate of the harbour, the water being carried in barrels.

LIGHT.—A revolving white light, attaining its greatest brilliancy every *forty-five seconds*, is exhibited from the lighthouse recently erected on the Monte dei Cappuccini, to mark the position of the port of Ancona. The light is of the second order, elevated 406 feet above the mean level of the sea, and visible in clear weather at a distance of about 21 miles. The tower is circular, and the lantern painted white; it stands on the mount at about half a mile eastward of the port, in lat. $43^{\circ} 37' 38''$ N., long. $13^{\circ} 31' 8''$ E.

The revolving white light at present exhibited from the lighthouse;

* In 1833, a 90-gun ship and two frigates were lying thus secured.

152 feet high, on St. Clemente mole head, will shortly be replaced by a *fixed red light* of the sixth order.

ANCONA ROAD.—The anchorage off Ancona is only available in fine weather, and is seldom visited excepting by vessels prevented from entering the harbour by contrary winds. A vessel of large draught, not finding room at the head of the pier, would be obliged to anchor one or two miles to the northward or north-westward of the light-house, in 8 to 11 fathoms mud bottom, good holding-ground. A good berth is in 8 fathoms, mud, Falconara, a small town, bearing W. S. W., and the Lighthouse on the mole S. by E. one mile. This anchorage is exposed during a bora and in south-east winds, which raise a heavy sea.

DIRECTIONS.—Mount Conero is a good landmark for Ancona either from the north or the east; in clear weather, and while still in the offing, Mount St. Vicino, one of the highest of the Apennine chain, and whose conical shape is remarkable, will also be seen about 27 miles south-westward of the town. In foggy weather, however, when proceeding from the eastward or from the coast of Dalmatia, care should be taken not to confound Mount Ardizze, near Pesaro, with Mount Conero; the latter is higher, and may, moreover, be easily distinguished by the objects on it already described; portions of the land near it, are not unlike the elevated ground in the vicinity of the Needles.

On nearing the land the new lighthouse on Monte dei Cappuccini will be recognized; then the town, and lastly the Mole head lighthouse, which should be steered for in order to enter the harbour. Care must be taken to guard against the current, which sets strongly to the south-eastward in the vicinity of Ancona point: the Mole Head lighthouse S.W. $\frac{3}{4}$ S. leads clear, westward, of Volpe bank. After entering the harbour, a vessel should proceed to the eastward to take up an anchorage according to her draught; if of large draught, she should anchor immediately on passing the head of the north pier.

With contrary winds it is advisable to bring up off the entrance of the harbour, and to warp in by means of the transporting buoys.

The COAST from Ancona is low and sandy as far as the town of Sinigaglia, about 13 miles north-westward from Ancona lighthouse; it is intersected by several rivers, the most important of which is the Esino, flowing about midway between two towns, and which, taking its rise in Fabriano mountains, separates the March of Ancona from the Legation of Urbino. Fishing boats are able to ascend it at high-water, by avoiding the banks at its mouth.

It has been already observed, that this shore is bordered by shoals to the distance of half a mile, where the depth is only 2 and 3 fathoms; it

should therefore, be carefully avoided. The high lands in the interior, which will serve to distinguish it, are, after Mount Conero, that of Montagnola, which has the shape of a sugar-loaf, and a tower and a few houses on its summit; Mount Barcaglione, with a convent and some houses on it; and Mount Falconara, which is of greater elevation than the first, and of similar shape, with numerous buildings and a castle on its summit; the last is south-eastward of, and near Esino river.

PORT SINIGAGLIA.—This harbour is at the mouth of Misa river. Two quays bordering the banks of the river form a basin about $4\frac{1}{2}$ cables in length, at the entrance of which is a depth of $6\frac{1}{2}$ feet, shoaling to less than 2 feet at its head; it is capable of holding 150 coasting vessels, which should take the precaution of making well fast to the quays on account of the current, which is very rapid during the freshes.*

The town of Sinigaglia, [anc. *Sena Gallica*,] is at the margin of the sea, on the right bank of the Misa, and between two fertile hills; it is large, and remarkable for its ancient ramparts and capacious store-houses, which contain great quantities of merchandise of every kind in July and August, the period of the great fair that is annually held here. The town has a population of about 8,000 persons. Provisions and water may be obtained in abundance. Vessels of 120 to 150 tons burthen are built here.

LIGHT.—A *fixed* white light is exhibited from a wooden structure 50 feet high on the eastern mole at the entrance of Port Sinigaglia; it is 59 feet above high water, and visible in clear weather at about 6 miles.

DIRECTIONS.—In clear weather the high peaks of Fano mountain will be seen from a great distance, and are useful in making the land when bound to Port Sinigaglia; this mountain bears W.S.W. 27 miles from the town, and has a forked summit. On approaching nearer, the village and steeple of Scapezzano, on a high hillock 3 miles W.N.W. of Sinigaglia, will be seen; also the village and tower of Albani, on another hill 2 miles to the southward; and, lastly, the town of Sinigaglia, and the light-beacon, on the eastern mole, which should be brought to bear S. by W., when the soundings are 4 or 5 fathoms.

A depth of $5\frac{1}{2}$ to $6\frac{1}{2}$ feet will be found, at high-water, in the passage between the moles. The lead should be well attended, for the banks at the mouth of the river occasionally change their position. In fine weather coasters anchor off the harbour at about a third of a mile north-eastward of the light-beacon. The number of vessels which resort hither at fair time is so great that the harbour cannot contain them all, and many

* See Plan of Sinigaglia, No. 1,678; scale, m = 3 inches.

anchor outside the jetties, prepared to weigh for Ancona on any symptom of a bora.

The COAST between Sinigaglia and Fano, $11\frac{1}{2}$ miles distant, is bordered by numerous banks. Cesano river, which rises at the foot of Mount Catria, and the Metauro, which descends from the Apennines, here reach the sea, and their rapidity is often so great that the mud brought down discolours the water to a great distance; these rivers are not navigable.

PORT FANO is formed by the mouth of the Metauro, along the banks of which quays have been constructed, but it is little frequented, being so much encumbered with sand as to render it often impracticable. The bottom of the harbour is a mixture of gravel, mud, and large stones. The entrance is between two jetties; near the extremity of the easternmost is a light-beacon. Large vessels anchor in fine weather at $1\frac{1}{2}$ mile in the offing.*

The town of Fano stands at the head of the harbour, and on the right bank of the river, and is entirely surrounded by well cultivated hills. Its numerous edifices and steeples give it the appearance of a large town; it has about 8,000 inhabitants, and contains large silk manufactories, but it affords few supplies for shipping.

LIGHT.—The light-beacon, 42 feet high, on the eastern mole of Port Fano, exhibits, at an elevation of 50 feet above high water, a *fixed* white light, visible in clear weather at 6 miles.

ASPECT of COAST.—Mount Catria, or Caia, and the high, forked, mountain of Fano, are good marks in making this part of the coast; on nearing the land, vessels will be guided by Mount Giove, on the summit of which is a large monastery with a very high steeple S.W. by W. 2 miles from Fano; also by Mount Novillara, on the wooded summit of which are a small village, and a round tower which bears W. by N. $\frac{1}{2}$ N. $3\frac{1}{2}$ miles from the port; and lastly by the town of Fano, and the Metauro beacon which stands on the beach 2 miles to the westward of the town.

From Fano the coast suddenly rises, the high Novillara and Ardizza mountains, running down to the edge of the sea. When seen in line from afar, these two mounts resemble Conero; they are lower than the latter, but like it, their greatest elevation is on the south east; they become depressed on the north-west, where Mount Ardizza terminates in a perpendicular cliff on which stands a house with a semaphore. The shore between Fano and Pesaro, 7 miles distant, is less foul than the

* See Plan of Fano, No. 1,678; scale, π = 3.3 inches.

preceding portion ; the sand-banks never extend to the distance of half-a-mile, where there is a depth of at least 2 fathoms.

PORT PESARO.—This harbour, at the foot of Mount Ardizza, is only a small channel which serves as a mouth to Foglia river, which takes its rise at the foot of Mount Sasso Simone. It is one mile in length, and the entrance is between two jetties, near the extremity of the eastern one of which is a square light-tower 32 feet high. The depth is about 6 feet, sandy bottom, between the jetties at low water, and the same depth is in the greater part of the channel, at the extremity of which, however, less than 2 feet will be found. The harbour will hold about 200 small vessels.*

The town of Pesaro stands near the sea shore in the valley formed by Mount Ardizza, south-eastward, and Mounts Fiorenzuola and Mezzo, north-westward. The population is about 17,500, and it contains silk, porcelain, crystal, and other manufactories.

LIGHT.—A *fixed* white light is exhibited from the tower on the eastern jetty. It is 50 feet above high-water, and should be seen in clear weather from the distance of 8 miles.

ANCHORAGE.—Vessels of large draught may in fine weather anchor at 2 miles from the land in $5\frac{1}{2}$ and $6\frac{1}{2}$ fathoms, mud bottom.

DIRECTIONS.—The mountains of Ardizza and Fiorenzuola, each crowned by a village, and between which stands the town of Pesaro, serve as land-marks to Port Pesaro. On approaching the coast the town and light-tower will be seen ; the latter should then be steered for.

The **COAST** between Pesaro and Rimini, distant 17 miles, is intersected by many rivers, amongst which the Conca, separating the province of Urbino from the Romagna, is the only one of any importance, fishing-boats being able to ascend it at high-water.

CATTOLICA.—To the westward of the high land of Fiorenzuola and Mezzo, the coast, in trending to the southward, forms a bay, at the head of which stands Cattolica village. Small vessels anchor off the land between the mouth of the Conca, and Gabicce village, and are partially sheltered from southerly winds by Mounts Fiorenzuola and Gabicce, but quite exposed to those between north-west and north-east ; south-westerly winds give rise to violent squalls.

DIRECTIONS.—In approaching the anchorage off Cattolica from the north-east, a vessel will have on her port bow the high hills of Gradara

* See Plan of Pesaro, in the *Adriatic*, No. 1,678 ; scale, $m = 2\cdot5$ inches.

and Luro, on the summits of which are some steeples visible at a considerable distance; also Mounts Fiorenzuola and Mezzo, from which off-shoots run down to the sea. On nearing the coast, Cattolica and the tower at the mouth of the Conca will be seen.

PORT RIMINO.—At 17 miles from Pesaro is the mouth of Marecchia river, which rises in the Apennines, and is navigable for about a mile to the north-west of the town of Rimino. The channel through which it discharges its waters into the sea forms the small harbour of Rimino, which is bordered by quays to the walls of the town. The depth is not more than 6 feet at the entrance, which is between two jetties projecting seaward, and on the eastern one of which stands a light-tower 60 feet high. The harbour will contain about 160 small vessels, which moor to the quays; but it is continually encumbered after excessive rains by gravel and flints brought down by the current, which occasionally is sufficiently rapid to cause the vessels fastened to the jetties to drive. It is likewise of difficult approach, owing to the strong current and to the banks at its entrance, which frequently vary in form and position.*

The town of Rimino stands on the right bank of the river at the foot of fertile hills, and its harbour was formerly of great celebrity. A fine marble bridge, of five arches having a span of 27 feet each, over the river, at the head of the harbour, and a triumphal arch erected to Augustus, still remain. It is a walled town with a population of 17,500 persons; it has manufactories of silk and of sulphur, and carries on a great trade in salt-fish.

Supplies.—Provisions, water, canvas, and cables can be procured, and there are ship-builders' yards.

LIGHT.—A *fixed* white light is shown from the tower about a cable from the end of the eastern jetty; it is 69 feet above high-water and visible at about 6 miles.

DIRECTIONS.—When standing in, to make the land in the vicinity of Rimino, vessels will in clear weather sight the high lands of Carpegna, and to the southward of the latter, Mount Sasso Simone, which is less elevated and has the appearance of being crowned by a wall. Mount San Marino (2,460 feet) will next appear in view; it will be easily distinguished by its pyramidal form and by the houses and towers on its summit. The town of Rimino will afterwards be seen, as well as the light-tower, which should be steered for.

The COAST from Rimino to Cesenatico, 11 miles distant, is sandy and

* See Plan of Rimino, No. 1,678; scale, $m = 3.3$ inches.

very low; it is of difficult access even for fishing-boats, owing to the banks formed by the numerous streams which disembogue along it.

The river Uso, the entrance to which is 6 miles to the northward of Rimino lighthouse, may be ascended by fishing-boats at high-water when the sea is smooth. The village and tower of Pedrera, as well as Bellaria and its tower, which stand at the mouth of the Uso, are the only remarkable objects on this part of the coast.*

PORT CESENATICO.—This harbour, like Rimino, is an artificial channel, formed by two piers projecting about half-a-cable seaward perpendicularly to the coast. It will contain about 70 vessels; it is, however, daily silting up, and depths of not more than about $3\frac{1}{2}$ feet, mud bottom, will be found at low water at the entrance, or inside. Cesenatico is the port of Cesena town, distant about 8 miles to the westward, and situated at the foot of the Apennines. Population 3,500.

LIGHTS.—Two lights are exhibited from the eastern mole of Port Cesenatico, which, notwithstanding its smallness, is the chief harbour on this part of the coast. One is a *fixed* white light, placed at an elevation of 55 feet above high-water, at about 472 yards from the extremity of the east mole, and is visible in clear weather at 12 miles; the other is a white light which *revolves* in one *minute*, with intervals of twenty-five seconds' darkness; it is placed at about 37 yards from the end of the mole at an elevation of 30 feet, and is visible 9 miles; the lights bear E. and S.W. of each other.

DIRECTIONS.—Cesenatico harbour is of difficult access owing to banks at the entrance. The Carpegna mountains, with flat summits and wooded sides, south-westward of Cesenatico village, are good landmarks for pointing out its position; as is also Mount San Marino, 16 miles to the southward; when the lights are seen a course should be steered for them, to enter the harbour between the two jetties, or moles.

PORT CERVIA, the entrance to which is 4 miles to the northward of Cesenatico, is formed by an artificial channel, which collects the waters from the surrounding mountains, retaining those of the sea by means of a sluice. Surrounded by salt marshes, this small harbour is now almost silted up, there being scarcely $1\frac{1}{2}$ feet in it at low-water. The episcopal town of Cervia stands on the right bank of the channel, and contains about 4,000 inhabitants, who are chiefly occupied in preparing salt from the marshes; about 50,000 tons are annually produced. The salt is kept in large storehouses, and constitutes almost the entire trade of the town.

LIGHT.—A *fixed* white light is shown from the jetty at Port Cervia to

* See Chart of the Gulf of Venice, No. 201; scale, $m = 0'18$ inch.

indicate the outer anchorage to vessels coming to load with salt; it is 42 feet above high-water, and visible in clear weather at 6 miles.

DIRECTIONS.—The Carpegna mountains and Mount St. Marino, distant 20 miles southward of Cervia harbour, serve as marks to make the land in its vicinity. On approaching, the light or the village, which is situated at the south-eastern extremity of a large pine forest, will sufficiently indicate the entrance of the channel into the harbour.

ASPECT of COAST.—The vast pine forest, the finest in Italy, which covers the coast for 18 miles, as far as Primaro, and extends 2 miles inland, commences at Cervia. On the whole of this extent the coast is sandy, very low, and everywhere intersected by marshes and streams, which render it uninhabitable. The high lands that border the coast nearer Ancona disappear almost entirely beyond Cervia, nor are the Apennines any longer seen a short distance inland.

Between Cervia and Ravenna, distant $10\frac{1}{2}$ miles, access to the coast is obstructed by banks of mud and sand brought down by the Savio river, which reaches the sea at 3 miles from Cervia, and by the Ronco and the Montone united, the mouths of which, accessible to small fishing-boats, lie $2\frac{1}{2}$ miles eastward of Ravenna.

Anchorage.—The coast between the Savio and the Montone forms a small bay called Bevano, at the head of which is a marsh which is gradually filling up. Coasting-vessels anchor in this bay to the north-west of Savio point, which protects them against southerly winds. The two towers of Ghiare on the east, in the middle of the marsh, and Torrazza on the west point out the position of this bay.

RAVENNA.—The harbour exists no longer; its remains are scarcely to be traced 2 miles to the north-west of the mouths of the Ronco and Montone, on a projection called Ravenna point, indicated by an old church situated at the edge of the sea. Corsini, distant 3 miles to the north-west of the point, now serves as the port of Ravenna.

The town, which originally stood on the sea shore, is on an eminence 4 miles from the sea, and in the midst of the forest above-mentioned. It is a large town, partly in ruins, containing about 15,000 inhabitants; silk is manufactured here, and it still has a rather important trade. The country around is marshy; fresh water is very scarce.

PORT CORSINI is merely the mouth of the Candiano channel, which commences at Ravenna, and during a course of 7 miles is fed by the waters of the neighbouring marshes. Vessels of 70 to 80 tons burthen ascend it with the flood as far as that town. The depth is 7 feet in the channel, and only about 3 feet at its entrance, which is daily becoming

more encumbered; strong winds from the north-easterly and south-easterly shift the banks and change the passage; the pilots generally mark it with poles.

LIGHT.—A *fixed* white, light, visible in clear weather at 6 miles, is exhibited at 293 yards from the extremity of the jetty on the right hand.

DIRECTIONS.—In standing in to make the land at Corsini, or at this portion of the coast, which is very flat and only visible at a short distance, the first town that will be sighted, before the pine forest, is that of Bertinoro, on a hill 12 miles westward from Cesenatico, and about 17 miles south-westward from Ravenna. The latter will subsequently appear behind the trees, and at last on the beach will be seen the houses of Corsini, and the light-tower, which stands quite alone, and is left on the port hand in entering the harbour.

The only remarkable object between Corsini and Primaro, distant 6 miles to the northward, is an isolated tower, 3 miles from the entrance to Corsini, and which points out the mouth of the Lamone or the river Delle Mele, navigable by fishing-boats when its waters are swollen by rains, or by the melting of snow.

PORT PRIMARO.—This small harbour is a former mouth of the Po, by which the Reno now discharges its waters into the sea. Vessels of 70 to 80 tons burthen ascend it as far as Faenza channel, distant 9 miles from the coast; those of 18 to 20 tons make use of this channel as far as Traghetto, which is 21 miles farther, and where an embankment separates it from the Po of Primaro, which communicates with Ferrara.

The passage is obstructed by banks between which the depth is only about 3 feet at low-water, and which change their position whenever the river overflows. These banks extend a third of a mile into the offing, and uncover in some places. The entrance, which should only be attempted at flood-tide, is marked by buoys on the *starboard* side of the channel.

The two towers of Bellocchio and Primaro, point out the entrance to the harbour. The village of St. Alberto, on the right bank of the river, 6 miles from the sea, is the centre of the trade of Ferrara with the coast; it possesses very fine storehouses, and provisions are abundant.

COMACCHIO.—To the northward of Primaro tower the coast is a mere tongue of low land, occasionally cultivated, but generally formed by a series of small sand hillocks, which separate the sea from the great Comacchio lagoon. The lagoon, fed by the waters of the sea which enter by the Palotta channel, embraces an area of 150 square miles, and has a depth of about 3 feet in every part, over a clay bottom.

The small fortified town of Comacchio, in the midst of unhealthy salt

marshes is on the Palotta canal, at 2 miles from the coast, and is surrounded by canals on every side. Its inhabitants, about 6,000, carry on a considerable trade in salt-fish, and particularly in eels, with which the lagoon abounds. Provisions are plentiful, but water is scarce; fishing-boats are constructed here.

Comacchio lagoon is entered by the mouth of the Palotta canal or Port Magnavacca. The waters of this canal are influenced by the tide, and during the months of February, March, and April, their depth increases to about 2 feet. Vessels of not more than 50 tons burthen enter Port Magnavacca, and smaller ones ascend with the tide as far as Comacchio by means of the Palotta canal. The mouth of this small harbour is buoyed like that of Port Primaro.

A tower one mile to the westward of the entrance to Palotta canal; the church steeple of Comacchio, $2\frac{1}{2}$ miles north-westward; and the tower of Bellocchio, situated on the shore near a pine forest which extends almost to Primaro, indicate the position of the channel.

ANCHORAGE.—Vessels anchor in 5 fathoms, at a distance of $1\frac{1}{2}$ mile from the coast between Ports Magnavacca and Volano, eight miles north-eastward. This is a good anchorage with winds between north and south-west; but bad with those between north-east and south, which render it necessary to weigh for Goro road.

PORT VOLANO.—This small harbour is on the western shore of Goro road, at the extremity of the canal which, receiving the waters of the Poatello and of the various canals which unite under the walls of Ferrara, is called the Po di Volano. The entrance is nearly blocked up by a sand-bank which runs parallel to the coast, extending about 5 cables to the northward. Small coasting vessels of 30 tons burthen ascend the Po di Volano as far as Codigoro village, where a few supplies may be obtained; thence they go as far as Ferrara. A tower, a few houses, and a *buoy* indicate the entrance of Port Volano; also a large forest of pine and oak trees, which, beginning at the tower, extends $4\frac{1}{2}$ miles to the northward.

GORO ROAD, or Sacca dell' Abate, is the name given to a bay 3 miles deep and of semicircular shape, commencing at Port Volano and terminating at the southernmost part of Maestra point. The whole of the head of this bay is encumbered by soil deposited by the several mouths of the Po. The anchorage in Goro road is considered a good shelter against winds between east-north-east and west, round by the north: the bottom being a mixture of mud and clay, it is often difficult to weigh the anchor when the precaution of occasionally sighting it has not been taken.

* "This is a very safe road in a bora gale. The *Bacchante* anchored in 6 fathoms, blue mud, excellent holding ground, the centre of Goro town bearing N.W. b. W., and was completely sheltered from the bora, or N.E. wind."

PORT GORO.—The name Po di Goro, or Porto di Goro, is given to a branch of the Po which leaves the principal stream at Papozze, and disembogues at the north point of Goro road. It is gradually becoming less available to coasters. Between its mouth and Papozze are Gorino, Goro, Mesola, and Ariano villages. At Papozze, vessels enter the Po Grande, which is ascended as far as Ponte-lagoscuro, where the channel which leads to Ferrara is taken.

The mouth of Port Goro, which has a depth of 3 feet at low-water, is frequently changed by the shifting of sand and mud brought down by the river, and is generally marked by poles. Vessels wishing to enter the river by Port Goro should take a pilot.

The church steeple of Pomposa, which bears W.N.W. $8\frac{1}{2}$ miles from Port Goro, and N.W. $\frac{1}{2}$ W. 4 miles from Port Volano, is a good landmark, for both of these ports; it is of a brownish colour, is badly constructed, and its conical cupola terminates in a sharp point.

The DELTA of the PO, as far as it protrudes beyond the general trend of the coast line, may be considered to begin to the southward at 2 miles north of Volano, and extend northward to Port Caleri, a direct distance of about 16 miles, but 32 miles as measured along the coast. The extreme eastern point, named Punta della Maestra, is 10 miles in advance of the usual line of shore. The general character of the land is a flat marsh.

* Remarks by Captain Sir William Hoste, R.N., 1809.

CHAPTER V.

WESTERN COAST—MAESTRA POINT TO AUSA RIVER.

VARIATION, 14° to $13\frac{1}{4}^{\circ}$ West in 1861.

THE COAST between Maestra point and Ausa river, north-eastward, embraces an extent of about 85 miles. It is a low sandy shore, along which numerous rivers empty themselves, forming by their embouchures almost all the ports which it affords. The navigation of the low shoal shore between Goro and Chioggia requires very great caution.*

ANCHORAGE—Vessels anchor on the open coast, between Ports Gnocca and Goro, the steeple of Govino village bearing N.N.W. $\frac{3}{4}$ W., and that of Gnocca N. by W. $\frac{1}{4}$ W.; the depth is $5\frac{1}{2}$ fathoms, good holding-ground. There is seldom much sea at this spot.

† “H.M.S. *Bacchante* rode out a very heavy bora gale off Gnocca, in $8\frac{1}{2}$ fathoms, in company with the *Mercury* and several prizes. There is an excellent watering-place near some fishermen’s huts, about $1\frac{1}{2}$ mile distant, at which our boats filled their casks in a depth of 4 feet.”

PORT GNOCOA—The Po di Gnocca is a branch of the Po which debouches at about two miles northward from Goro. Its mouth, or Port Gnocca, is generally preferred by boats proceeding to Venice by the inland channels, in order to avoid rounding Maestra point, and the navigation of a difficult, and, in the winter season, dangerous coast. The shoals off this mouth frequently shift their position, and piles are placed to indicate the channel.

Gnocca church and Donzella steeple serve to point out the position of this port, to enter which a pilot is required.

PELLAZZA BAY is a large bay near the middle of the delta of the Po. It is open to the south-east, and has a depth of 10 feet at about one mile from the shore, whence the depth increases gradually to $5\frac{1}{2}$ fathoms, mud and clay, at about one mile beyond. The best berth is in the north-east part of the bay. This is a good anchorage in northerly and in westerly winds, and may be considered safe even in those between north-east and south, owing to the goodness of the holding-ground. The south-west side is rendered shoal by deposits from the mouth of the Donzella.

* See Admiralty Chart, Adriatic Sea; Rimino to Cape Promontore, No. 201; scale, $m = 0.2$ inch.

† Remarks by Captain Sir William Hoste, R.N., 1809.

PO RIVER.—The various mouths of the Po, which may be considered eight in number, including the Po di Volano, embrace an extent of about 26 miles of coast, the north-western of which is Porto della Maestra.

The river has its source in the Grisons Alps at Monte Viso, and after having flowed 280 miles from Turin, eastward, reaches the Gulf of Venice, receiving in its course the waters of several small streams. Lombardy, which it intersects, is entirely an alluvial black fertile soil of great depth, and is one of the richest plains in the world.

The soil conveyed from the interior, and deposited in the sea, has, in the course of ages, greatly changed the configuration of the coast, and the broad Maestra point has been formed.

From Piacenza to Papozze and Serravalle villages, 19 miles below Ponte-lagoscuro (the port of Ferrara), the river flows between embankments; it bears the name of Po Grande till it reaches these villages whence it divides into the Po di Maestra and the Po di Goro, which are now the chief navigable branches.

Between Pelazza bay and Maestra point there are three mouths which lead to the Po di Tolle, a small branch of the Po Grande, and thence to the Po di Maestra. They contain numerous sand-banks, and as there are scarcely any recognizable objects, the navigation of them is difficult, even for the pilots. The four practicable passages have but sufficient depth for vessels of about twenty-two tons burden.

MAESTRA POINT is very low, consisting of marshy lands, divided by streams into a vast number of islands, which frequently change their form, especially after heavy winter rains, and in spring at the melting of snow. It is advisable to avoid closing it, as shoal water extends to a considerable distance; the shoals may be readily distinguished in day-time and fine weather by the discoloration of the water. It is the most eastern portion of the very low land forming the delta of the Po; a haze generally hangs over it, and it should be approached with great caution.

Port Maestra is the north-western mouth of the Po, at about 4 miles from the point. Access is extremely difficult, as the sandbanks frequently shift, and the current is very rapid; the passage is, in some places, marked by piles.

Contarina and Pomposa town steeples form good marks for distinguishing the position of the mouths of the Po; the former, which is 10 miles westward from Port Maestra, is white; the latter, which is about 8 miles westward from the Po di Goro, is the higher of the two, of a dusky colour, and surmounted by a conical cupola.

The COAST between Maestra point and Sotto Marina battery, at the entrance of Port Chioggia, is a low sandy shore, seldom visited. The

soundings are about 4 fathoms, mud and clay, at half a mile from it, excepting for rather more than 4 miles northward of Maestra, where very shoal water extends at intervals, to the distance of $1\frac{1}{2}$ mile.

PORT LEVANTE is a small harbour, forming the entrance to the Bianco canal; the latter leads to Adria and Astiglia, and communicates by channels with the Adige and Po Grande. It has sufficient depth for vessels of very light draught only, and the sand-banks at its entrance often change position.

The only objects recognizable from seaward are two houses, surrounded by straw huts, about one mile southward from Levante.

Ports Fossatini and Caleri are merely two boat-passages to some small lakes.

The RIVER ADIGE, is one of the chief rivers of Italy; it rises in the Swiss Alps, traverses the Tyrol, passes by Trent and Verona cities and reaches the sea between two embankments, near the latter. It communicates with the lagoon ports, and is navigable by boats as far as Verona, and those of very light draught ascend to a short distance above Trent.

Port Fossone forms the mouth of the Adige, and is 5 miles southward from Port Chioggia. It is divided into two by a shifting sand-bank: the eastern channel is scarcely practicable; the western is taken in calm weather at high-water by boats drawing about five feet. The depth at three-quarters of a mile outside is $5\frac{1}{2}$ fathoms; close to, the water is very shoal.

At about 1 mile abreast of the port, the depth is $6\frac{1}{2}$ fathoms, Madonna di Marina bearing N.E. by E. $\frac{3}{4}$ E., and Brondolo village steeple, southward of Chioggia, bearing due East.

The RIVER BRENTA has its source in the mountains between Trent and Belluno, and flows over a flat country from Bassano to the sea; it enters a navigable canal leading from Padua to Venice, and quits it near Dolo to debouche at Port Brondolo. Near the latter it receives the waters of the Bacchiglione river, which rises northward of Vicenza, through which it flows. The Bacchiglione is navigated by boats of very light draught.

The Brenta communicates by canals with Chioggia, Padua, Vicenza, the Adige, and the Po.

PORT BRONDOLO, which is the mouth of the Brenta, and receives the waters of many small streams, is one mile northward from the Adige: like Port Fossone, it is obstructed by sand-banks. When the river is swollen by rains, very strong eddies are formed at the entrance, which is between a battery on the starboard hand, and a large public

building on the other. The depth at the entrance is 5 feet, and it increases gradually inside.

Brondolo village is one mile from the sea, and about 2 miles north-westward from the port.

THE VENETIAN COAST comprises the whole of the extremely low shores between Maestra and Isonzo points, or nearly the whole 33 miles of coast-line at the head of the Adriatic sea. It is intersected by marshy lands, which render the air insalubrious during the summer; the largest of these marshes forms the lagoons of Venice and Grado.

The only sea-marks on this coast are the steeples of some of the more important villages, and it is bordered by sand-banks; the depth at $1\frac{1}{2}$ mile from it is about $5\frac{1}{2}$ fathoms.

The lagoons are sprinkled with islets of varied and pleasant aspect, which rise little above the level of the water. These lakes form a basin, the length of which, from north to south, is about 25 miles, and which is separated from the sea by a long strip of land forming the *Lido*, a natural sea-wall consolidated by artificial means. This serves also as a protection to the inner anchorages; there are five passages through it leading to Venice, which are called ports, viz., Ports Brondolo, Chioggia, Malamocco, St. Erasmo, and Tre Porti. The lagoon ports, which are gradually becoming shoaler, are the mouths of existing rivers, or of former beds.

The islands are about one hundred in number; twenty-five of them are inhabited; the city of Venice is built upon the largest of them.

The navigation of the lagoons and of the various channels between them is in a great measure carried on by tracking boats; pilots are generally employed, and the winding passages are marked by piles. The flood-tide enters with rapidity, and speedily spreads over the scattered ponds and muddy morasses; so that at high-water the scene is strangely changed, presenting one vast sheet of water, which reaches from the islands on the coast to the mainland.

The coast between Brondolo and the entrance of Port Chioggia has nothing conspicuous but the steeple of the small *Madonna di Marina* chapel, and, to the northward of this, *Sotto Marina* village and Chioggia town.

PORT CHIOGGIA is the embouchure of the Perognoia canal, which is fed by the waters of the lagoons, and of several smaller canals, and reaches the sea between St. Felice and Caroman forts, on the southern extremity of Pelestrina island. This part of Pelestrina is bordered by a shoal, which reduces the passage to a width of less than $1\frac{1}{2}$ cables; and a triangular sand-bank extends along the coast from the island to about one mile southward from it, covering completely the entrance

and leaving between itself and the shoals southward of Caroman fort, a channel less than $1\frac{1}{2}$ cable wide, with a depth at high-water of about 3 fathoms.*

The port is the portion of the channel which lies between the forts and its confluence with Aseo channel; the depth in the middle is from 5 to 7 fathoms. It is well sheltered from sea winds; the best anchorage is southward abreast of some salt-ponds. Vessels of light draught lie southwestward of St. Felice fort, backing their anchors; but it is desirable, when a long stay is intended, to warp inside Perognola canal, which is the real port of Chioggia.

ANCHORAGE.—Vessels detained by contrary winds, or waiting for flood-tide, anchor in about 8 fathoms mud and sand off the entrance at about 2 miles from the shore, with Pelestrina dome bearing N. $\frac{3}{4}$ W., and the steeple of Madonna church W. by S. $\frac{3}{4}$ S., but this anchorage cannot be recommended excepting in fine weather, or with off-shore winds, as there is at other times a heavy sea.

Botto Marina, Madonna, Poco pesce, Aseo, and Pelestrina channels, which meet at Chioggia and communicate with Brenta, Malamocco, and Venice, can be taken by small coasting vessels only.

Chioggia has the advantage over the other lagoon ports of a greater depth of water at its entrance, which however is often impracticable; a heavy sea is raised by north-easterly, south-easterly, and easterly winds, and the current is frequently very strong: it is advisable to take a pilot.

The town is built upon an island, and contains about 24,000 inhabitants, the chief occupation of whom is fishing. It is traversed by a fine road, and by a canal crossed by nine bridges: it contains several ship-building yards.

DIRECTIONS.—Vessels bound to Chioggia should approach the low coast with caution until the buildings of Pelestrina are seen; the town is on the port, and the village on the starboard, side of the entrance. The high land in the vicinity of Padua is rarely visible, and the two objects which first present themselves are generally the steeple of Pelestrina, and that of the dome of Chioggia, which is very high, and terminated by a long arrow-shaped vane. When these have been distinguished, the shore southward of the port should be closed and coasted along till Chioggia dome bears W. by N. $\frac{3}{4}$ N., when the dome should be steered for until Brondolo steeple bears S.W. $\frac{1}{4}$ W. in line with Ca Rossa, a house near Madonna church. The vessel will then be at the southern extreme of the passage, where the depth at high water is 3 fathoms, and a N. $\frac{3}{4}$ W. course should be steered until Brondolo steeple is just to the westward of that of Madonna, and an opening between St. Felice fort and a barrack westward of it is seen.

* See Plan of Venice and Port Chioggia, with view, No. 1,483; scale, $m = 1\cdot4$ inch.

Nearly the same course as before should be steered towards the re-entering angle of Pelestrina wall, till Aseo house in the centre of the lagoon bears N.W. b. W. $\frac{3}{4}$ W. Aseo house should then be steered for till St^a Dominica steeple bears S.W. $\frac{3}{4}$ S. Steering upon this bearing as a course, the commencement of Perognola passage, which is marked by piles, will be reached.

The lead should be kept constantly in use by vessels approaching or quitting Chioggia, and it is not prudent to go within a depth of 13 fathoms to the northward of Maestra point.

PELESTRINA ISLAND.—Between Chioggia and Malamocco the lagoon is protected seaward by Pelestrina, a narrow, sandy island, 6 miles long, which is thickly peopled and well cultivated. The part near Chioggia presents nothing remarkable, but beyond Pelestrina village, the steeple of which is one of the most conspicuous objects on this portion of the coast, the island is covered with houses, and at the farther extreme are St. Pietro fort, at the entrance to Malamocco, and several batteries.

A high sea-wall of limestone extends along the shore and protects the inner channels and anchorage. The sand-banks along the shore of Pelestrina are changeable in form and extent.

PORT MALAMOCCO, by far the most important and most frequently visited of the lagoon ports, forms the entrance to the only passage to Venice, 7 miles distant, for vessels of considerable draught. Its central position also gives it an advantage, as vessels overtaken by strong north-easterly or south-easterly winds, which are very dangerous on this coast, can always anchor at Pelorosso, or, putting to sea, find shelter under the shore of Istria. Government regulations oblige vessels to take a pilot here when bound to Venice, or up any of the various channels.

The port is formed by the extremities of Fiscolo and Spignon channels, and has sufficient space for a considerable number of vessels. One anchorage is on the port hand, near the entrance, between a small channel and St. Pietro bastion; another is more towards the north-west part of the port in 4 fathoms, at the mouth of Spignon channel; in proceeding to it care must be taken to pass to the southward of the *buoy* off Fort Alboroni, and then to steer north-westward; a third place is at the entrance to Fiscolo channel, at the north part of the port, in 2 to 3 fathoms.

The entrance is between Pelestrina and Malamocco islands, and is defended by Alboroni and St. Pietro forts on their extremities. Two jetties mark the passage; this, like the entrances of all the ports on this coast, is obstructed by sand-banks, which, besides diminishing the anchorage space, render access difficult without a fair wind and fine weather; vessels drawing 18 feet can enter Malamocco at high-water.

Rocchetta Channel forms a good anchorage, but is not of easy access owing to a shoal southward of Alboroni fort. Vessels anchor at two parts of it; one is where the entrance becomes shut in, the other just beyond Rocchetta shoal.

TIDES.—At Malamocco it is high water at full and change 10h. 30m. Rise 2 feet.

LIGHTS.—The entrance of port Malamocco is indicated by 2 lights. The inner one is in the lagoon, precisely on the south bank at the entrance of Spignon channel, and is a *fixed red* light, visible at 6 miles; the outer one is a *fixed white* light, on the curve of the interior breakwater at the Rocchetta, and is visible at about 12 miles. Two light houses in one by day, or the occultation of the inner light by the outer by night, leads midway through the passage between the two breakwaters.

VENICE is built upon 72 islets or shoals upon foundations of piles and stone. It stands near the centre of a lagoon extending from Brondolo on the south to near Piave, a length of 30 miles by a breadth of 5 miles. This city is divided into two unequal portions by the *Canalazzo* or Grand canal, or channel, the course of which is from N.W. to S.E., in the form of the letter S; it is further intersected by 146 smaller canals, or channels, termed *rii*, which are crossed by 306 bridges. One bridge only crosses the Grand canal, and is named the Rialto. The small canals serve as streets, on which some 9,000 gondoliers, or boatmen, gain their livelihood. Venice is the best built and the most populous city on the Adriatic, and contains 110,000 inhabitants. It is connected with the main land at Mestre since Oct. 1845 by a viaduct, carrying a railway, 3,936 yards long. The pride of the Venetians is the Piazza di San Marco, distinguished by its campanile and stately edifices; the cathedral of San Marco is one of the finest in Europe. A respectable naval arsenal is at the eastern extremity of the city. Venice was declared a free port in 1829, but its commerce, which once embraced every known part of the world, is in a very reduced state.

Water of good quality is in request; the best is in the arsenal. Rain-water is preserved in cisterns, and recourse is had to the Brenta river. Since the year 1847 seven artesian wells have been sunk in the town; water also has been brought in from the river Sile by pipes laid along the railway viaduct.

DIRECTIONS.—If off Venice in the evening with too fresh a breeze for anchoring, it would be advisable to keep 3 or 4 leagues to the eastward under snug canvas, taking care when standing in not to allow the vessel to be set too near Maestra point by the south-westerly current. Time of tide and draught of water are particulars which should be carefully considered with reference to these ports. As early a period during the flood-tide as the draught of the vessel will permit, should be chosen for entering Malamocco.

It would not be prudent to proceed with a strong north-easterly or south-easterly wind. In fine and clear weather, the coast should be approached until the *campanile*, or tower of San Marco, 323 feet high, is seen: this tower belfry is terminated by a pyramid, surmounted by the figure of an angel. The steeples of Pelestrina and Chioggia will be subsequently sighted, and lastly the high walls which border the lagoons. When the atmosphere is very clear the Euganean hills in the rear of Venice are visible. When San Marco tower has been made out, a course should be steered to bring it to bear N.N.E. $\frac{1}{4}$ E., and that of Pelestrina, S.W. $\frac{1}{4}$ W., when the vessel will be abreast of the entrance $1\frac{1}{2}$ mile distant, and in 7 fathoms. Thence, a S.W. by W. $\frac{1}{4}$ W. course must be steered, until the tower of St. Pietro fort has been brought to bear N.N.W. in one with Casa Matutina, which is on the shore southward of the fort: the vessel should then run on this bearing till Chioggia and Pelestrina steeples are in line, bearing S.W. $\frac{3}{4}$ S., when she will be at the entrance of the channel, and may steer northward, passing the extremities of the south and north jetties. When the bastion of S. Pietro fort, which is on the south side of the port, has been made out, one of the anchorages above-mentioned may be chosen, care being taken to leave on the *starboard* hand the *first* buoy.

* “The direction which we took to cross the bar is precisely as marked on Captain W. H. Smyth’s plan of 1819. The least water was $2\frac{1}{2}$ fathoms; the ship drew 13ft. 10in. There are no marks for crossing the bar; the pilot each time made his boat place herself in the channel, where also there is a buoy. We passed about a cable westward of the buoy, and at the same distance from St. Pietro point; the water then becomes deep for a short distance. Off Fort Alboroni a spit runs to the southward, about a quarter of a mile, and has a buoy on it. The channel is then marked the whole way to the city by clusters of piles, which serve to support the banks and preserve the channel, as well as for making fast hawsers. We frequently used them when coming down to check the bow round when turning at the angles, which are very sharp for a long vessel, especially when the tide is with her.

“The channel becomes much narrower at the first convent, Poveglia, but more simple, it being only necessary to use caution in turning the vessel.”

MALAMOCCHO ISLAND is 7 miles long, extending from Port St. Erasmo to that of Malamocco: in the centre of it is the village. The northern portion is the most elevated; between this and Alboroni fort a high wall winds along the shore, and affords protection from the heavy sea occasioned by strong southerly and easterly winds. The village, Malamocco fort in the middle of the island, and the two forts at the extremities, are the only conspicuous objects. Malamocco, like Pelestrina island, in

* Remarks by Mr. H. A. Moriarty, Master H. M. S. *Medea*, 1845.

separating the sea from the lagoons of Venice, serves as an effectual barrier to the canals against the violence of sea-winds.

CORTELLAZZO BANK.—This extensive shoal of gravel and clay runs parallel with the shore of Venice, between Port Malamocco and Caorle town, preserving a distance of 7 to 11 miles. It affords considerable protection from the sea to the anchorages on the coast.

PELOROSSO ROAD.—An anchorage, in 8 fathoms mud, sand, and clay, is abreast of, and 3 miles from the entrance of Port Malamocco: with the obelisk-form steeple, near St. Pietro fort, in line with the Casa Matutina, and the south extreme of Malamocco village in one with Poveglia village steeple.

Vessels also anchor more to the northward with Malamocco steeple in one with that of Poveglia bearing N. by W. $\frac{3}{4}$ W., and Chioggia steeple S.W. $\frac{1}{4}$ W. This is about half-way between Malamocco village and the Alboroni, a cluster of trees northward of Alboroni fort.

Pelorosso road is exposed to winds between north-east and south-east: it is not advisable to anchor here in a large vessel, excepting in fine weather, and to await high-water for entering Malamocco; under other circumstances, it is better to proceed to Piave anchorage. Vessels should be quite prepared for a start when lying at this road, which may be more easily quitted than the other anchorages on the coast, when forced by bad weather to get under-weight.

It is customary for vessels of considerable draught to anchor here, in order to complete their cargo from Malamocco, or to lessen their draught on return, by lightening ship before entering this shoal port.

* "Three miles eastward of the entrance to Malamocco is placed a buoy over moorings laid down for a line-of-battle ship. There are three anchors, with 30 fathoms of cable on each, and a bridle of 30 fathoms passing through the buoy; the depth is 8 fathoms. This appears to be a good position, and as close as a vessel could lie with safety; but it would require at least 4 hours for a boat to pull to the city."

Poveglia is a convenient place for refitting ship; the use of large storehouses may be obtained.

Supplies.—Water from Brenta river can be procured in native boats, and fresh beef and vegetables are abundant.

PORT LIDO lies at the north extreme of Malamocco island. It was formerly the chief port of the lagoons, but is now inaccessible at low-water to vessels drawing more than 7 feet. There is a direct communication between Lido and Venice arsenal, which is only one mile distant.

* Remarks by Mr. H. A. Moriarty, Master H.M.S. *Medea*, 1845.

The apparent, or false, entrance to this port is between St. Nicolò and St. Andrea forts, both of which are easily distinguished; the real entrance is between two shoals, which form a very narrow passage at the south end of which the depth is only 10 feet.

The depth in the port, along the shore of Malamocco facing St. Nicolò fort, is 7 and 8 fathoms, sandy bottom: it is customary to let go an anchor well backed, and carry out a cable to the shore south-eastward. In bad weather it would be still more impracticable to enter this than any other of the lagoon ports, the surf then forming one long line of breakers. In such weather a vessel should proceed to Sacca di Piave anchorage or seek shelter under the shore of Istria.

Water may be procured on the northern, inside, point of Lido, from six wells about 200 yards from the beach, and just inside the quarantine station. It is very good at first, but soon deteriorates.

LIGHT.—A *fixed* white light stands on a knoll of sand at the north side of the passage, and is visible in clear weather at the distance of 9 miles.

DIRECTIONS.—A local pilot is almost indispensable. On recognizing the tower of St. Marco of Venice, which will be the first seen, a course should be steered to bring it to bear W. $\frac{1}{4}$ S., and that of Burano, N. $\frac{1}{4}$ E.: the shore should then be approached, and when the entrance to the port has been distinguished, a course parallel with the shore should be steered till the steeple of St. Lazaro has been brought in one with Quattro Cantoni house, bearing N.N.W. $\frac{1}{4}$ W. The vessel should run on this bearing till Burano steeple, which will have been kept in sight, bears N.E. $\frac{3}{4}$ N., or a little to starboard of the east extreme of Lido mole; she will then be in the channel between the two sand-banks, at about half-a-mile from the shore, and in a depth of 10 feet. A course nearly parallel with the shore, or about N.E. $\frac{1}{4}$ E., should then be steered till the entrance to the port is quite open, when it may be steered for, giving St. Nicolò point a wide berth. The bottom bordering St. Andrea fort is rocky.

St. Lazaro steeple may be known by its being on the north side of its edifice, and Quattro Cantoni by the towers on its four angles, and by its being close to the sea.

PORT ST. ERASMO is a narrow channel, the entrance to which is so much obstructed by the sand-banks off Port Lido, that it is only practicable by boats or vessels of very light draught, in fine weather at high-water. The entrance, which is three-quarters of a mile from St. Nicolò fort of Lido, may be known by a stone column erected on a sand-bank.

ST. ERASMO island is well cultivated; it is defended by two batteries one at its south extreme, and the other at its west extreme, opposite the new Lazzaretto.

PORT TRE PORTI has its entrance in the same bay as the last two described harbours. It is formed partly by the lagoons, partly by the sea, and leads directly to Burano, and from thence to Trieste; it also communicates by canals with Caorle and Venice. The shoal which obstructs the entrances to Ports Lido and St. Erasmo, bars that of Tre Porti, which is inaccessible at low-water to vessels drawing more than 4 feet, and is therefore of little importance.

ANCHORAGE.—Vessels may anchor in 7 or 8 fathoms, at about 2 miles from the shore, anywhere along the coast between the entrance to Tre Porti and Piave point. Small vessels come to, nearer the shore, in about 4 fathoms, sand and clay.

MEZZA SACCA ANCHORAGE, (or Sacca di Piave), which is the best within the above-mentioned extent, is 8 miles S.E. by E. $\frac{1}{2}$ E. from the church of St. Nicolò of Lido, and about $2\frac{1}{2}$ miles from the shore; the depth is 7 and 8 fathoms, sand and clay. There is good shelter here in a bora from Piave point, but a vessel is exposed to easterly and south-easterly winds, which however, need not be feared with good ground-tackle.

It is customary to lie at single anchor in fine weather and when a short stay is intended, but in winter, vessels should moor with open hawse to the south-east, and it is advisable, if the weather should look threatening from eastward, to weigh and proceed for shelter under the coast of Istria. Mezza Sacca is a good anchorage in northerly and in westerly winds, but bad in those from south-east and from south-west, which send in a considerable swell, and in which Pelorosso anchorage should be preferred.

Vessels also anchor westward of Mezza Sacca, with Burano steeple bearing N. $\frac{3}{4}$ W., in line with Tre Porti point.

DIRECTIONS.—In approaching Mezza Sacca anchorage from the north-eastward in clear weather, a vessel should never, after making the land northward of Venice, bring the tower of St. Marco of Venice to the northward of W. by N. $\frac{1}{4}$ N. The land should be closed till the chimnies or turrets of two white houses, called the Sorelle, are seen; they are midway between Piave and Tre Porti. The anchor should be dropped in 7 or 8 fathoms, with the Sorelle houses in one.

PORT PIAVE VECCHIA is 7 miles from Tre Porti. The coast between them consists of sandy hillocks; small boats have no difficulty in landing during fine weather. The harbour is a winding channel about 30 fathoms wide, and extends one mile inland. Vessels drawing 7 feet can enter at high water; there is a depth of 4 feet at low-water. It is the ancient embouchure of the Piave, and is now that of the river Sile, which has a depth of 10 feet as far up as Treviso, about 20 miles from the sea.

Vessels anchor in any part of the channel, taking care to make fast to the shore, as security against a sudden gale, and the freshes from the Sile. The Piave rises at the foot of Mount Paralba, and is navigable from the sea as far as the village of Noventa, about 14 miles.

LIGHT.—There is a *fixed* white light on the east point of the entrance of the Piave; it is 148 feet above the sea, and visible in clear weather at the distance of 14 miles.

DIRECTIONS.—The entrance to Port Piave will be recognized by a redoubt on the port-hand, by some houses in ruins, and by Cavallino gates. A vessel should not approach within one cable of the shore till the passage, which is quite safe, has been clearly made out.

PORT CORTELLAZZO, 8 miles from Piave Vecchia, is formed by the waters of Piave river, and communicates with Caorle and the lagoons by various channels navigated by vessels of about 20 tons burthen. The entrance, which has a depth of only 3 feet at low-water, is obstructed by a bar of sand parallel with the coast; between the latter and the south-west extreme of the bar is a narrow and difficult passage, which runs north and south; at high-water, when no leading marks can be distinguished, the difficulty is greatly increased.

DIRECTIONS.—The position of this port may be recognized by two houses close to a large tree at about two-thirds of a mile from the entrance; by Caorle steeple, and by the high land in the interior. A northerly course up the channel should be steered, with the lead going, till the redoubt on the beach at the left side of the entrance bears N.W. by W. $\frac{3}{4}$ W. when a mid-channel course should be preserved to the anchorage.

CORTELLAZZO ANCHORAGE, opposite the port, has a depth of about 8 fathoms, clay and sand. Vessels generally anchor at 2 miles from the shore, between Port Piave and Caorle town. Cortellazzo bank is marked in the charts as about one mile wide, extending 25 miles parallel to the shore at an average distance of 9 miles. It has from 10 to 12 fathoms on it, with a gravelly and muddy bottom; both within and without the bank the depths are 13 and 15 fathoms, sand.

The COAST between Port Cortellazzo and Caorle, 8 miles distant, consists of sand-hillocks scarcely elevated above the level of the sea. Under favourable circumstances it may be closely approached, but in winter it is unadvisable to do so, as north-easterly and south-easterly winds, which are of long duration, blow right upon it. Ports Sta. Croce and Altanea lie 2 and 3 miles respectively north-eastward from Cortellazzo; they have only sufficient depth for small boats, which run into them for refuge when overtaken by bad weather.

PORT ST^A MARGARITA is the embouchure of the Livenza river, which is fed by the waters from Friuli mountains, and communicates with Venice, Treviso, &c. The entrance is partly obstructed by a shoal, which commencing at the north-east point extends about 2 cables in a south westerly direction. Other shoals which run out south-eastward leave a passage to the port less than 1 cable wide, with a depth of little more than 3 feet at low-water. The small craft which visit this port anchor in 1 to 2 fathoms, muddy bottom.

DIRECTIONS.—Caorle steeple, and the redoubt on the right of the entrance, are the only marks for this port. As the channel is very narrow it cannot be taken excepting in winds between east and south-west; and the lead should be kept constantly in use, as the current of the river and strong south-easterly winds occasionally alter the form of the shoals. A fair wind is required for quitting the port. Caorle town is on the sea shore, about 1 mile north-eastward from St^a Margarita, and forms the only conspicuous object on this part of the coast. The steeple is 162 feet high, and visible at a considerable distance. A stone jetty protects the shore abreast of the town from the sea. Water and provisions of all kinds are obtainable at Caorle.

GRADO LAGOONS, also called Marano lagoons, commence at Caorle; they resemble those of Venice, and embrace an extent from east to west of 30 miles; most of the 25 islands, the chief of which is Grado, are uninhabited.

FALCONERA ROAD and PORT.—Eastward of Caorle, the coast forms a bay partially protected seaward by a sand-bank, which, commencing at the north-east point of the bay, upon which is a battery, runs directly towards the point upon which stands the church of St. Maria degli Angeli, leaving between the point and it a passage less than $1\frac{1}{2}$ cable wide, with a depth at high-water of 7 feet.

This anchorage, which has a depth of only 5 feet, is very bad with easterly and south-easterly winds, when a considerable sea is raised; and vessels of greater draught than this only cross it at high-water on the way to Port Falconera.

The port, which communicates with Portogruaro, Caorle, Venice, Treviso, &c., is formed by the waters of Lemene river, and by a small branch of Levenza river, and has a depth at low water of 10 to 15 feet. The anchorage is off the Treasury buildings on the right hand.

A narrow shallow channel, suitable to boats only, is on the western shore, near the middle of Falconera road; it is called Port Palangone.

THE COAST between Falconera road and Port Baseleghe, 3 miles north-eastward, is a very low sandy shore, bordered by a shoal, which extends

from it between 2 and 3 cables, and parts of which are dry at low-water. Vessels may come-to in about 5 fathoms, good holding-ground, at $1\frac{1}{2}$ mile from the shore, for temporary shelter from a westerly gale, or from heavy northerly or north-easterly winds; but in sea winds this anchorage cannot be recommended.

Port Baseleghe.—This small port, the entrance to which is barred by a sand-bank which at times is nearly awash, is only accessible to boats in smooth weather at high water. The steeple of Caorle and a redoubt on the starboard side of the entrance, serve to indicate the position.

The COAST between Baseleghe and the mouth of Tagliamento river, $4\frac{1}{2}$ miles distant, consists of low, sandy hillocks: a few scattered trees alone break the uniformity of the view.

FRIULI BAY.—The indentation of the coast between Tagliamento point and Grado is commonly called Friuli bay, also Tagliamento bay.

Port Tagliamento is formed by the embouchure of the river of this name, which is navigable by boats for about 13 miles. The entrance to the port, which is between two shifting sand-banks, is only a few fathoms wide, and is nearly dry at low-water. The position may be recognized by Caorle and Marano steeples, and by the low jutting-out point.

The COAST between Ports Tagliamento, and Lignano, $3\frac{1}{2}$ miles distant, is very low, and bordered by shoals, which render access difficult even to boats of the lightest draught. Vessels sometimes anchor momentarily at about 2 miles from the shore in $5\frac{1}{2}$ fathoms, clay.

PORT LIGNANO, which lies between Venice and Trieste, is formed by the embouchure of Stella river; its spaciousness and the depth of water at the entrance render it the best and the most useful of the harbours on the Friuli coast. It communicates by channels with Marano and Muzzana, and, by the Stella, with Palazzuolo. The best berth is off the mouth of Marano channel, where vessels moor with open hawse to the southward, the anchor to the eastward being backed, and are well sheltered. Small craft moor off the mouths of Videra, Lustri, and Bioni channels.

The depth at low-water spring-tides is 10 feet at the entrance, and $5\frac{1}{2}$ feet, mud, inside. Vessels unable to stem the ebb-tide, which after heavy rains is very rapid, usually anchor at the entrance, opposite the Treasury and battery on the left hand. This anchorage is quite exposed to sea winds.

DIRECTIONS.—The low coast in the neighbourhood of Lignano should be cautiously approached, and endeavour made to discover the entrance

before arrival within one mile of it. The deeply notched outline of the Friuli mountains, and the low Marano steeple, form good landmarks. On recognizing the entrance, a north-westerly course should be steered for the middle of the channel, until a small 10 feet shoal has been passed; after which the western shore should be approached by steering about N.W. $\frac{3}{4}$ W., and the redoubt which stands upon it must be left on the starboard hand. A mid-channel course should then be again kept to clear Marignano shoal, which extends about one mile southward.

It would be imprudent to attempt to beat into Lignano against a fresh breeze and ebb-tide; a vessel should rather bear up and anchor abreast of and about 2 miles from the entrance, where a depth of $5\frac{1}{2}$ fathoms good holding-ground will be found, with Grado steeple bearing E. by S. $\frac{1}{4}$ S.; Marano steeple, N. $\frac{3}{4}$ E.; and Tagliamento point, W. by S. $\frac{3}{4}$ S.

PORT ST. ANDREA.—This small harbour lies about one mile north-eastward from Lignano, from which it is separated by a shoal. The entrance is barred by a sand-bank which dries at low-water.

The COAST between St. Andrea and the mouth of Ausa river, 3 miles distant, consists chiefly of sandy hillocks; it is low, and skirted by shoal water, which extends in some parts to about half-a-mile.

CHAPTER VI.

EASTERN COAST.—AUSA RIVER TO MERLERA POINT.

VARIATION, $18\frac{3}{4}$ to $13\frac{1}{2}$ West, in 1861.

THE eastern coast of the Adriatic sea, beginning from the north extreme of Venetia embraces an extent of 560 miles from the Ausa river to Cape Linguetta. The portion included in the following chapter is between Ausa river and Merlera point.*

THE **FRIULI COAST** lies between the Ausa river and Trieste, and forms the bottom of the Gulf of Trieste: its aspect, which, to the southward, is low and sandy, changes completely at Duino, becoming high and precipitous.

PORT BUSO, which, with the exception of Lignano, is the best port on the Friuli coast, is 3 miles eastward from Port St. Andrea; the intermediate shore, which consists chiefly of sandy hillocks and marshy ground, is low and bordered by shoals, which extend in some places about half-a-mile.

This port communicates with all the lakes and receives the waters of the Anfora, Ausa, and Corno rivers. It has a depth of 7 feet at the entrance and of $2\frac{1}{2}$ fathoms, inside. It is customary to anchor in the middle, and lay out cables to the windward shore.

DIRECTIONS.—The entrance, which is indicated by Marano steeple north-westward, and that of Grado south-eastward, is between two shoals, which run parallel with the shore on either side. At the extremity of the eastern shoal is a depth of one fathom. When the fort on the western shore is seen, it should be brought to bear N.E. by E. $\frac{1}{4}$ E., and then steered for until the entrance has been entirely opened. Boats ascend Ausa river as far as Cervignano village, about 10 miles.

PORT ANFORA is only separated from Buso by a shoal, which uncovers at low water, and extends $1\frac{1}{2}$ mile eastward from the point on which is the fort. The depth at the entrance is only 3 feet at low-water, and $2\frac{1}{2}$ fathoms inside.

Eastward of Buso, the Friuli coast forms a long promontory terminating in Sdobba point; it is very low, and the only remarkable object is Grado steeple, which at a distance appears on the horizon. Sand-banks render approach difficult even to small boats: the most dangerous shoal is

* See Admiralty Chart, Adriatic Sea, Rimini to Promontore, No. 201; scale, m = 0.2 inch.

[A.D. S.]

Mula di Muggia, which, beginning at Grado, extends as far as Sdobba point, stretching out in some places $1\frac{1}{2}$ mile southward, and leaving between it and the shore a channel which forms Port Primero.

PORT GRADO is 5 miles south-eastward from Buso, and communicates by water with Buso, Marano, and Aquileia; it is partly formed by the waters of the lagoons which surround Grado village and partly by the sea. The depth at the entrance is 3 feet sandy bottom, and from 2 to 3 fathoms, mud and clay, inside; the passage is between two extensive shifting sand-banks which are alternately affected by strong freshes from the lagoons and by heavy sea winds. A pilot is necessary.*

Population of Grado, 2,200, chiefly engaged in the tunny fishery.

PORT PRIMERO is, 2 miles south-eastward from Grado village and lies between two sand-banks and the shore. The entrance, which is open to the south-west, has at low-water a depth of only 3 feet, sandy bottom, and there are about $3\frac{1}{2}$ fathoms mud and clay in the north-east part of the channel, between the banks and the shore.

DIRECTIONS.—The only recognizable objects on making for Port Primero are a single tree at the bottom of the port, and Grado village steeple. A course for midway between these two should be steered till the latter has been brought to bear S. $\frac{3}{4}$ E., when the vessel will be about 4 cables from the shore, and her head may then be put to the eastward to proceed along the channel with the lead constantly in use.

PORT SDOBBA, at the western extremity of Mula di Muggia, is the embouchure of Isonzo and Isonzato rivers, and communicates by water with Primero. Its entrance is divided into two by an extensive sand-bank, which, by its frequent changes alters the depth and width of the passages. The western passage has less than 3 feet at low-water; the eastern, is then nearly dry. The depth increases towards the mouth of the Isonzato, where there are about $2\frac{1}{2}$ fathoms mud and clay.

DIRECTIONS.—The position of Sdobba is easily recognized, being at the easternmost extreme of this part of the coast; Aquileia steeple will be seen north-westward and Monfalcone rock to the northward. Very fine weather is required for entering, as approach is dangerous when there is the least break on the shoal.

SACCA DI PANZANO is a bay about 3 miles deep, extending from Sdobba point to Duino; it has depths of from 2 to 5 fathoms on a bottom

* According to Austrian writers, Richard Cœur de Lion was wrecked on a small bank near Aquileia: it was undoubtedly on the shoals of Grado.—Remarks by Captain W. H. Smyth, R.N.

of mud. Sdobba point projects a long way to the eastward, and is low and shoal. The shore on the west side of Panzano bay is low, and rendered inaccessible by numerous shoals; several streams flow into it. The village of Monfalcone may be seen on an eminence.

PORT DUINO.—The village and castle of Duino stand upon a rocky eminence at the foot of which is the port, a creek protected by a mole: the depth at the entrance is 15 feet, and about 3 feet muddy bottom within. Easterly and south-westerly winds raise a swell inside.

PORT TIMAVO is the embouchure of the river of this name. It lies under a steep rocky eminence, on the summit of which is Duino castle. The depth is about $2\frac{1}{2}$ fathoms at the entrance of the port, and scarcely 3 feet, muddy bottom, inside. It is well sheltered from all but southerly and south-westerly winds, which raise a considerable swell; but it is partially protected from these by a mole. It is through this port that Venice and the whole of Friuli are supplied with grain exported from Trieste.

DIRECTIONS.—Timavo river flows into the sea about 3 miles north-north-eastward from Sdobba point, and immediately opposite an extensive sand-bank, the position of which is altered by currents. The entrance to the port is between this bank and the shore, forming a channel running from south-east to north-west, parallel with the latter. The depth at the outer part is 3 feet, but it increases to 9 feet, sand and mud. The position of the channel is easily recognized, being opposite a walled enclosure upon a hill at a small distance inland, and about half-a-mile from Duino village.

The COAST between Duino and Trieste, an extent of 10 miles, forming the bottom of the gulf of Trieste, presents an elevated and almost inaccessible shore, which affords shelter in three small bays to coasters, but no place of refuge to larger vessels. It may be safely approached to a distance of one cable, where the depth is 5 to 6 fathoms, soft mud. Upon eminences near the sea, are Duino, St^a Croce, and Opschina villages.

The three small bays alluded to, are those of Duino, Sistiana, and Grignano. Duino bay has a depth of 13 feet at the entrance, and about 3 feet inside, muddy bottom. Sistiana, which is exposed to westerly and south-westerly winds, has a depth of about 7 feet, bad holding-ground. Grignano, about 5 miles south-eastward from Sistiana, is exposed to westerly and south-westerly winds, for protection from which a mole is in process of construction. The depth is little more than one fathom, mud.

Water may be obtained at springs, in the latter two bays.

The GULF OF TRIESTE comprehends the north-east portion, or head of the Adriatic, and is comprised between Pt. Tagliamento on the north

and Pt. Salvore on the south, which are 20 miles apart. From this limit the gulf is 20 miles deep, and at its head or eastern extreme lies the city of Trieste. The bottom, throughout, is of mud and clay, rendering it often difficult to weigh the anchor; the depth in no part exceeding 15 fathoms.

PORT TRIESTE, which is of semicircular form, has sufficient space for a considerable number of vessels of any size. It is sheltered from all winds between north and south, round by east, but exposed to those from the westward; St^a Teresa mole, which extends northerly from St. Andrea point, protects it from south-westerly winds. The depth at the entrance is about 8 fathoms, soft mud, but it decreases gradually towards the quays, at about half-a-cable from which there are 10 to 13 feet. The south-eastern portion is entirely bordered by stone quays, with six projecting moles or jetties. Southward of St. Carlo mole is a small wet dock, called the *Mandracchio*, near which is the health-office, and to the northward the entrance to the canal or basin.*

At the northern extremity of the port or bay is the new Lazzaretto, one of the largest and best arranged in Europe. It has a separate harbour or basin enclosed by piers, some acres in extent, in which 50 vessels can perform quarantine at once. The building contains lodgings for 200 persons, and is surrounded by a wall 24 feet high.

Vessels of war, or of great draught, anchor at the entrance of the port in about 9 fathoms, between St^a Teresa mole and the new Lazzaretto, the castle flagstaff bearing S.E., the Lazzaretto battery N.E., and mole lighthouse south. There is a good berth for a few vessels opposite St. Carlo mole, in 7 and 8 fathoms, near a *buoy*, which marks the wreck of a frigate which blew up in 1812. Vessels wishing to be very near the shore moor abreast of the health-office, with four cables, two of which are taken to the quays. Inside of St^a Teresa mole, which is the real harbour of Trieste, there is sufficient space for about fifty vessels.

Just north of the mole of San Carlo a broad canal, 20 yards wide and 12 feet deep, extends in a south-east direction for 600 yards into the quarter of the new town called Theresien-stadt, by means of which vessels of considerable burden can be unloaded almost at the merchants' doors.

The bora reaches Trieste with great violence from the high lands in the vicinity, especially in the winter season; in the summer, westerly winds which send in a heavy swell, are the most inconvenient, but they never last long. In strong southerly winds the water rises sufficiently to inundate parts of the town.

TRIESTE TOWN is well situated on an acclivity at the foot of a range

* See Plan of Trieste, No. 1,433; scale, $m = 6.0$ inches. Remarks by Mr. J. Bodie, Master, 1848.

of hills of about 900 feet, above which rises the Julian Alp, with its pass reaching 1,800 feet, and its summit 4,000 feet, above the sea. The slopes are covered with white villas, the residences of wealthy merchants, and which being scattered in every direction, present a picturesque appearance from the sea. The population of the town and suburbs is said to be 83,000.

Trieste was declared a free port in 1750, and it now engrosses most of the commerce of the Adriatic, which has been greatly increased by the establishment of the Austrian Lloyd's steamers, 80 in number, which communicate regularly with all the principal ports of the Levant. They have also an arsenal for the repair of their vessels south of the town near Parieto, begun in 1852 and now complete. It is about 25 acres in extent, and contains a dry dock 300 feet long, having 25 feet over the entrance sill, shut by a caisson; also parallel to it a patent slip, 700 feet long, capable of taking up a vessel of 2,000 tons; the outer end can be closed by a caisson, and the water pumped out, so as to take in two or three vessels at once. The south face is lined with quays, alongside which steamers can lie, and there are three cranes, worked by steam, capable of lifting 60 tons each. In the factory is a steam hammer and every requisite for the repair of boilers; 2,000 men are said to be employed on the works. It appears to be a well regulated and efficient establishment.

At what is termed the Technical establishment, just to the westward of the arsenal, and at Muggia, are a steam factory and foundry where engines are made, among others those for the imperial frigate *Donau*, and the line of battle ship *Kaiser*, of 800 horse-power; they have the means of casting a weight of 15 tons. The establishment is said to employ 1,500 men.

SUPPLIES.—Fresh water was formerly scarce, and the best to be had at the new Lazzaretto, but since the year 1858 an aqueduct, formed on the slope of Mount St^e Croce, 6 miles to the northward, brings into the town, by means of pipes laid along the railway, abundance of water, which is carried down to the marina. It is pumped up 400 feet by a steam engine. All kinds of refreshments, and means of refitting vessels, are cheap and of good quality.

CONSULS and agents for Great Britain and the United States, and for more than 30 different states reside in Trieste. An excellent tribunal of commerce exists, and a school of navigation, to which an observatory is attached. The English church is in the Contrada del Fontanone, the service begins at 10 o'clock.

On the Punta di Grignano the Archduke Ferdinand Maximilian has a magnificent villa, named *Miramar*, a conspicuous object from all parts of the bay. The electric telegraph connects Trieste with all the

capitals in Europe, also with Cattaro. A railroad is carried over the Julian and Scemmering Alps, at a summit level of 2,893 feet above the sea, to Vienna in 24 hours, and to Venice, by Udine, in 8 hours.

TRADE.—The arrivals and sailings at the port of Trieste in the year 1857 were, inwards 2,215 vessels of 382,692 tons; outwards 2,239 vessels of 399,796 tons. The value of the imports and exports for the year 1855 was, imports 2,569,245*l.*, exports 2,783,134*l.*

LIGHT.—A *revolving* light, showing a bright face every *half-minute*, stands on St^a Teresa mole head; it is 116 feet above the sea, is visible 13 miles, and may be seen before losing sight of that on Cape Salvore: the light-house is a grey, round tower.

DIRECTIONS.—In steering for Trieste, vessels should endeavour to make the coast of Istria about Rovigno, the high steeple of which may be seen at a great distance; and here pilots may be engaged either for Venice or Trieste. The long flat on the north side of the gulf near Grado village should not be approached within a depth of 6 fathoms.

WESTERN COAST of ISTRIA.—Istria is a mountainous peninsula. It produces in moderate measures, oil, wine, wheat, honey, beeswax, silk, hides, tallow, building-timber and salt, and possesses marble and freestone quarries. The climate is considered unwholesome; the inhabitants, about 193,000, are of Slavonic origin, and their chief occupation is agriculture.

The west coast of Istria commences southward of Trieste and terminates at Promontore point, an extent of 65 miles, forming numerous indentations, among which are some excellent ports, the largest of which are between Trieste, and Salvore; the safest are southward of the latter; every village may be said to have its little port. The shore between the two points is bordered by rocks and shoals which sometimes extend as far out as 3 miles. The soundings near the land vary greatly; between Salvore and Rovigno there is a depth of about 13 fathoms, muddy bottom, outside the rocks; near the shore between Rovigno and Promontore there is frequently a depth of 22 fathoms, mud, close to the shore.

ANCHORAGE.—There is anchorage all along the coast of Istria, but regard must be had to the direction of the prevailing winds. Generally, a vessel may safely come to, during north-easterly and south-easterly winds, within a zone of 3 to 10 miles from the land, in good holding-ground. With bora winds a vessel should never, if avoidable, anchor between Trieste and Salvore, and it is not safe to bring up on any part when the wind blows upon the shore, unless the weather promise to continue very fine; and then preparation should be made for an immediate start.

MUÏA or MUGGIA BAY is formed by St. Andrea and Sottile points, about 2 miles apart; it is open to westerly winds, which send in a considerable sea, but it affords good shelter inside for small craft in the bora and in easterly winds.

There is a depth of 8 fathoms, muddy bottom, half-a-mile from the shore, with the steeple of St. Servolo village bearing N.E. by E. $\frac{1}{4}$ E. A vessel bearing up for this anchorage in a bora gale should in passing St. Andrea point, on the port tack, take care to avoid the shoal water which extends a few cables from it: the anchor should be weighed as soon as the gale is over, to prevent the probability of being caught on a lee shore.

With sea-winds a vessel will find good shelter in about 8 fathoms, abreast of the small Muia village, which may be recognized by a castle upon which is a signal tower. Here it is customary to lay out a cable to the shore. Coasting-vessels moor in a small dock abreast of the village. There are no hidden dangers in Muia bay. Some salt-ponds are close to the seaside.

Water may be frequently procured with facility from two streams at the bottom of the bay: there is a small run at the village, but in summer it is generally dry.

GROSSA POINT BAY lies between Grossa and Sottile points, and has a depth of 6 to 10 feet, soft mud. The shore of the bay is protected by high land, under shelter of which vessels of light draught come to during bora and south-east gales, taking care to back their anchors. Both points are bordered by shoal water, of 4 to 7 feet depth, which extends about 3 cables from them.

CAPODISTRIA BAY, between Grossa and Strugnano points, is open to the westward; it is 5 miles wide, and has in the centre a depth of 11 fathoms; thence the soundings decrease rapidly, and on a line north and south with the town steeple, the depth is 16 feet; eastward of this line, and in Stagnon and Campi bays, the depth is only from 3 to 6 feet, muddy bottom. The bay is bordered by high lands, the highest peaks of which form Mount Trajan.

The usual anchorage is in 11 fathoms, mud, at about one mile north-westward from the town, where there is good shelter from off-shore winds, but full exposure to westerly winds, which occasion a heavy and sometimes dangerous sea. The holding-ground is not good, and vessels when obliged to take this anchorage generally back their anchors.

Capodistria town has an imposing appearance from seaward. It stands on a rocky islet at a short distance from the land, and communicates with the main by a stone causeway. It is the chief city of the Istrian peninsula, and has a population of 8,000, but is now of less importance, owing to the proximity of Trieste, and to the absence of a safe commodious port. The

air is wholesome, notwithstanding the close vicinity of numerous salt-ponds. Some docks, or coves, under the town afford shelter to small coasters and fishing-boats, which also seek refuge from a gale in Stagnon bay, eastward of the town; between it and the mouth of the small river Risano.

Supplies.—An aqueduct leads a good supply of water to the seaside; provisions of all kinds are obtainable. The only other resources are those suitable to the construction and refitting of small native craft.

ISOLA PENINSULA.—This is a small rocky point joined to the main by a narrow, low, strip of land. A small dock or cove, protected by a mole, has sufficient space to shelter about 100 fishing-boats. Vessels may anchor abreast of Isola in about 8 fathoms, muddy bottom, at half-a-mile westward from Isola village, which stands upon the peninsula.

Water in abundance may be obtained from a spring to the southward of Isola.

STRUZNANO POINT, which forms the south extreme of Capodistria bay, is an elevated cliffy point of brownish colour. Like the whole of the coast, as far as the point upon which stands Pirano town, it is of bold approach.

PIRANO PORT and ROAD.—These are formed by Sicciole bay, which, although unprotected from the bora, affords the best anchorage on the coast of Istria for vessels unable to reach Trieste, or which being driven by strong weather from the port or road of the latter are obliged to bear up for shelter. The bay is surrounded by high land, and large vessels may anchor anywhere in 7 to 9 fathoms, soft mud, but bad holding-ground, which renders this place dangerous in a bora gale. With this wind, the anchorage under mount Mogorone three-quarters of a mile southward from the town, is less insecure; here there is a depth of 8 fathoms, mud, between the town and port Rose, but no vessel should, if avoidable, remain during a bora gale, as in the event of being driven from her anchors she would be unable to gain an offing, and would infallibly be cast upon the iron-bound coast, which is terminated by Salvore point.*

Northerly and north-westerly winds, to which Pirano bay is open, are seldom strong enough to cause a vessel to drive, and at the worst she would be forced upon the mud at the bottom of the bay. Westerly winds send in a considerable, but not dangerous, sea into the road.

The port is a small inlet well protected westward by a mole; it has a depth of 2 fathoms, and around it is built the town, which contains about 3,600 inhabitants, who share with Rovigno nearly the whole commerce of

* See Plan of Port Pirano, No. 1,501; scale, $m = 1\frac{1}{7}$ inch.

this coast. On the shores of the bay are several salt-ponds, from which considerable profit is derived. Good water on the east side of the road, and provisions in abundance, may be procured.

There is a 4-fathoms shoal about 1 mile E. by N. $\frac{1}{4}$ N. from St. Giorgio steeple of Pirano town. This steeple, being 236 feet above the sea, may be seen at a great distance.

PORT ROSE.—This small port under mount Mogorone, off Pirano road, affords shelter to small craft. The convent of St. Bernardino, on the left of the entrance, points out its position.

CAPE SALVORE is the western extremity of the Istrian peninsula. It is low, of dark appearance, and dangerous in foggy weather, although there is a depth of 11 fathoms at about 3 cables from it.* Vessels sometimes lie almost in a calm under cape Salvore when the heaviest bora gale is blowing in the gulf of Trieste.

SECCA DEL GOBBO (Humpback), a rocky shoal with 24 feet over it, lies with the lighthouse on Bassania point S. $\frac{1}{4}$ E., distant $6\frac{1}{2}$ cables; Pirano steeple E. by N., and Salvore point East northerly. At one-third of a mile N.N.W. of the above shoal are some patches with 5 fathoms on them.

LIGHT.—On Bassania low point, the south-west extreme of Salvore cape, is a *fixed* white light, 110 feet above the sea, which may be seen at the distance of 24 miles. This light is perceived from Grado, and is useful to the navigation of the whole gulf of Trieste.

Sipar Shoal is a rocky bank, parts of which are at times uncovered, about $1\frac{1}{2}$ mile south-eastward from Bassania point light, and extending nearly one mile from the shore; it lies abreast of a small church, and a few houses near the beach.

The COAST between Bassania point and Omago, $3\frac{1}{2}$ miles to the southward, is of little elevation; it forms several small bays, which have a depth of 2 to $3\frac{1}{2}$ fathoms, and in which coasting-vessels seek temporary refuge from the bora.

PORT OMAGO.—This port is a small semi-circular bay, open to the north-west, the entrance to which is reduced to a width of little more than one cable by 2 lines of rocks, which extend towards each other from the extremes of the port, and between which is a column built on a rock. The passage on the north side has, at low-water, a depth of 12 to 13 feet, which increases inside the column, and at the anchorage, where there are from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms, mud and sand, with the church steeple, which is 109 feet above the sea, bearing S.S.W. $\frac{1}{2}$ W., and Pegolata

* A vessel is reported to have been wrecked in 1817 upon a shoal 2 miles south-westward of Cape Salvore, having been set upon it in a calm by a strong current. Purdy mentions a 4 fathoms shoal, 4 miles W. $\frac{1}{4}$ N. from Salvore, and extending 6 miles S.S.W. $\frac{1}{4}$ W. This shoal is not marked in any recent chart.

point N.N.W. $\frac{1}{4}$ W. This anchorage is preferred to that of Pirano by small craft bound to Venice, as it is better sheltered from the bora.

Omago town, which is on an isthmus, has about 600 inhabitants. Water, which requires filtering, may be obtained in small quantity: provisions are scarce.

DIRECTIONS.—The village will be readily seen at some distance. The column should be steered for, and the passage northward of it taken. There is a southern passage, but it is extremely narrow, and the depth is little more than one fathom. Vessels from the northward should not closely approach Pegolata point, which is shoal.

The **COAST** between Omago and port Quieto, 7 miles southward, is clean, and has a depth of 8 to 10 fathoms, at a distance of 3 cables; it is low, and forms several small bays.

PORT DAILA is the principal of these bays; it affords shelter to coasting-vessels from easterly winds in about 10 feet, muddy bottom. A rocky bank, parts of which uncover with the tide, extends about $1\frac{1}{2}$ cable from the south point of it. A castle and some houses indicate the position of Daila, which is about $4\frac{1}{2}$ miles from Omago.

Port Cittanova, 2 miles southward from Daila, is open to the south-west, and being bordered by shoal rocky bottom has but a very small space, with a depth of 2 to 3 fathoms, soft mud. It is sheltered from all winds, being greatly protected on the south-west quarter by Val shoal, which lies off the entrance. Piles are driven into the shore, to which vessels secure their cable during bora winds.*

Cittanova town is situated on a projecting point, which separates Cittanova and Quieto bays; it contains only about 700 inhabitants, most of whom are fishermen. The air is considered unwholesome.

Val Shoal, in a depth of about 10 feet, lies W. $\frac{3}{4}$ S. of Cittanova town, at a distance of more than 4 cables from the point on which stands the battery. Between it and this point there is a passage with a depth of $5\frac{1}{2}$ fathoms, mud and shells, in the centre.

DIRECTIONS.—In approaching this port, the town should never be brought to the southward of E. by S. $\frac{1}{4}$ S., and a course should be steered midway between the north point and the town, as both shores must be avoided, being bordered by shoal water.

PORT QUIETO derives its name from the small Quieto river, which has its source in the interior of Istria, traverses Montona forest, celebrated for its curved, or knee, timber, and empties itself in this bay. Quieto is open to the westward, and has a depth of 13 fathoms, soft mud, on the western side, and of $6\frac{1}{2}$ to $8\frac{1}{2}$ fathoms in the middle; the sound-

* See Plan of Ports Quieto and Cittanova, No. 1,564; scale, $m = 1.3$ inch.

ings decrease gradually towards the eastern shore, which is composed of marshy grounds, communicating with the mouth of the river. The best berth is in the middle of the bay, in 8 to 12 fathoms.

The narrow Torre creek on the east side has a depth of 13 feet, affording perfect security to small craft, which anchor and make fast to the shore.

Quieto is a good anchorage for vessels of any size, being sheltered from all but westerly winds; these send in a considerable sea, which, however, is never dangerous, and a vessel parting from her anchors would be driven on soft mud at the bottom of the bay. The bora never blows as hard here as at Pirano, and its direction is not such as to prevent egress, if it should be desirable to quit.

It is at Quietto that Venetian vessels of war formerly landed or shipped their guns and heavy stores, when the weather did not permit them to lie safely at Pelorosso. Ship-building timber is brought here from the woods of Trieste, Venice, &c.

Supplies.—Excellent water may be procured in abundance at a spring close to the sea, half way between Bernazza point and Torre creek. Provisions cannot be obtained, but oil, wine, and firewood, and other articles may be procured from Cittanova.

DIRECTIONS.—On approaching Quietto from southward the shore should be avoided, in order to keep clear of Civran shoal, which lies southward of Dente point, the south extreme of the bay; and on approaching from northward, Cittanova point should be allowed a berth of one mile, to avoid Val shoal.

The position of Quietto may be easily recognized by Buie village, which stands on an isolated eminence, about 9 miles inland.

PORT CERVERA is a bay between Dente point, and Satturel point $1\frac{1}{2}$ mile south-eastward; it is divided into two; St^a Marina bay north-eastward and Porto Vecchio south-eastward. The depth at Cervera is about $7\frac{1}{2}$ fathoms, soft mud; and with the small St^a Marina chapel on the port shore, bearing S.W. by W. $\frac{1}{4}$ W., a vessel will be sheltered from all but westerly winds.

The south side of the entrance to Cervera is obstructed in a great measure by a shoal, and by 2 islets, which protect it from the sea south-westward. The northern shore should, therefore, be closed on entering the bay. The village is on a rather elevated spot on the south side, and near it is a small stream.

Civran shoal is off Satturel point, from which it extends north-westward about one mile; it borders the whole shore between Satturel, and Bossolo point one mile to the southward, and four small rocks lie in the middle of it. In order to keep outside of it, a vessel should not pass to the eastward of a line joining the west point of Cittanova, and St. Nicolò islet of Parenzo.

THE COAST between Cervera and Parenzo is low and winding; to the southward of Civran shoal it is quite clean. Of the various bays which it forms, Bossolo and St. Marina are the chief; they are about 3 cables in circumference, and have a depth of 2 to 3 fathoms, sandy bottom.

PORT PARENZO, about 14 miles from Quieto, is formed by a peninsula upon which the town is built; by Barbaran islet, northward, and by St. Nicolò islet and the coast southward; it has a depth in the middle of $2\frac{1}{2}$ to 4 fathoms, hard mud, good holding-ground.*

This port is considered the best shelter in bad weather on the coast of Istria, for vessels drawing not more than 15 feet, but for large vessels is only safe in land winds.

The small ancient town contains about 2,000 inhabitants; it has a large church, a basilica of the time of Justinian (A.D. 540), and of course one of the oldest Christian churches existing, and an old convent, near which is a conspicuous tall round turret. Pilots for Venice may be procured here.

ST. NICOLÒ ISLET, which is about one mile in circumference, has a shoal at its north-west extreme, which runs off to nearly a cable northward, uniting it with the Low Calbola islet; it is planted with olive trees. Quarantine is performed on it. Peota Shoal is about 3 cables S.W. by S. from the tower on St. Nicolò, and has on it a depth of only one fathom.

BARBARAN ISLET lies about one cable westward from the extreme of the peninsula, upon which is the town, forming with it a passage with a depth in the middle of 4 fathoms; the current is sometimes strong through this pass, and sets upon the shoal under the town.

Supplies.—Water is obtained with difficulty; the town is scantily supplied by cisterns and wells. Wine and salt-fish are procurable.

DIRECTIONS.—The best channel to Parenzo is between Barbaran and Calbola; it is about 2 cables wide, and has a depth of 7 fathoms. In order to keep well clear of the shoal water off the north extreme of St. Nicolò, the Barbaran side of mid-channel should be preserved.

An old convent near the middle of St. Nicolò, an old tower on its western part, and the town itself sufficiently indicate the position of the port.

THE COAST between Parenzo, and Lemo channel 5 miles to the southward, continues to be winding, and becomes rather more elevated; it forms several bays, but, excepting Fontane and Orsera bays, they can only afford shelter to boats or very small craft in south-easterly, northerly, and the intermediate winds. The coast is bordered by rocks and shoals, but they do not extend in any part so far as a mile from the shore, and the outer

* See Plan of Port Parenzo, No. 1,568; scale, $m = 3 \cdot 3$ inches.

ones between St. Brigida rock, the southernmost of the group, and Port Gravina, southward of St. Nicolò islet, may be safely approached.

PORT FONTANE or GRAVINA is one mile south-eastward from St. Brigida rock ; it has a depth of about 4 fathoms, mud in the centre, and sufficient space for small craft only. It is protected seaward by Conigli rock, and by an awash shoal at its entrance. Fontane village near the middle of the bay, and St^a Maria chapel, indicate the position of this anchorage.

DIRECTIONS.—To avoid the shoal, awash, at the entrance, the point on the port-hand, which is of bold approach, should be closed. If the passage between Conigli rock and the shoal should be taken, the rock should be closed and the south point of the bay allowed a wide berth to keep clear of a shoal which extends about $1\frac{1}{2}$ cables northward from it.

GROUP of ROCKS.—Southward of Conigli rock a group of rocks commences, extending $1\frac{3}{4}$ mile along the coast, or as far as Orsera point ; the outermost is not a mile from the shore. Coasting-vessels find their way among them in depths varying from 7 to 14 fathoms. Marmi d'Orsera, a rocky bank, awash, is the only danger presented by them ; it is 2 miles N.W. by W. $\frac{1}{2}$ W. from Orsera castle, and about 6 cables in circumference.

ORSERA BAY is narrow, completely sheltered seaward by St. Giorgio islet ; it is a very useful place of refuge for small vessels, which anchor in the middle in 2 to 3 fathoms, muddy bottom ; the convent on the north side bearing N.E. by E.

Vessels bound to this bay should pass on the north side of St. Giorgio, between it and Galinera rock. Orsera castle, on a hill at the bottom of it, points out the position, and is a good mark for clearing the Marmi d'Orsera.

SHOALS.—Between St. Giorgio islet and Lemo channel, one mile to the southward, several dangerous shoals run off from Conversada rock, which is close to the north point of the channel ; they terminate with Lunga rock, from which shoal water extends nearly 3 cables north-westward. Lemo shoal nearly covers the entire entrance to Lemo channel, being about one mile from Corsini, the south point of the latter ; the least depth on it is about 2 fathoms.

LEMO CHANNEL.—This long narrow channel is $4\frac{1}{2}$ miles northward from Rovigno light. It has a depth of 14 to 17 fathoms hard mud, good holding-ground throughout. It is entirely bordered by high land, and the shores are steep. The greatest width is little more than 3 cables.* Water is scarce ; quantities of firewood are exported hence to Venice.

* See Plan of Lemo Channel, No. 1,566 ; scale, $m = 1\cdot1$ inch.

DIRECTIONS.—The best passage is between Lemo shoal and Corsini point, which is elevated, of bold approach, and easily recognized at a distance. The passage on the north side of Lemo shoal is narrow, and the north extreme of the entrance is bordered by shoal water.

PORT BORA is a little bay immediately northward of Rovigno town ; it is open to the westward, and protected on the north-west side by Figarola rocks, and has a depth of 14 fathoms, mud, in the centre, which is the best berth for large vessels. Small vessels anchor farther to the southward, and secure to the shore under the town.

PORT ROVIGNO, marked by the lofty spire of the church of St^a Eufemia, is separated from the bay of port Bora by the peninsula upon which Rovigno town is built. It is an indifferent anchorage, and is visited by small vessels only. The best berth is south-eastward of St^a Caterina islet, which lies near the middle of it. Boats find shelter on the east side of a mole close to the town.

Rovigno town contains about 11,000 inhabitants ; many are pilots, to procure whom vessels bound to Venice and the mouths of the Po, often touch here. It carries on considerable trade with Venice, Trieste, and the various ports of Dalmatia, and is the residence of the Bishop of Rovigno. Cistern water is alone to be found, and the quantity is scarcely sufficient for the wants of the inhabitants. All kinds of provisions may be procured. Coasting-vessels are built here.

LIGHT.—Rovigno light is on the small island St. Giovanni di Pelago, which is $2\frac{1}{2}$ miles S.W. $\frac{3}{4}$ S. from Rovigno. It is a *revolving* and alternately *red* and *white* light 73 feet above the sea, and may be seen at the distance of 15 miles ; it is about mid-way between Salvore and Promontore lights.

DIRECTIONS.—On making the land from abreast of Bora and Rovigno, mount Caldero—or Maggiore—appearing to be divided into two parts will be seen north-eastward, and afterwards the pyramidal steeple of St^a Eufemia, which is very high, and surmounted by a winged figure. Vessels from the southward may pass at a short distance southward of St. Giovanni di Pelago, Astorga, St. Andrea, and Asino rocky islets. The east side of St. Giovanni is shoal. St. Andrea, the largest of the group, is of moderate elevation, excepting near the centre, which is very low, is covered with wood, and has a monastery on its north side. A rocky bank, awash, which lies to the northward of Asino, will be cleared by keeping to the westward of the line passing through St. Giovanni, and Figarola rocks off port Bora.

The passage on either side of St^a Caterina may be taken, avoiding its south-east extreme, close to which is shoal water.

SAGNUOLI or PILOTI Rock, the westernmost of the rocks close to the southward of Rovigno, has a staff on it for the purpose of making signals to Rovigno for a pilot.

The COAST between Auro, the south point of Rovigno, and Fasana channel, is less elevated than in the vicinity of Rovigno, gradually becoming lower towards the south. It forms several small bays which are seldom visited excepting by coasters loading with firewood, and are all open to the westward. It is bordered, as far as Barbariga point, by rocks which extend about $1\frac{1}{4}$ mile from it; the southernmost of these is Porer rock.

BRIONI ISLANDS.—These two islands are about 3 miles south-westward from Barbariga point; they run parallel with the coast, forming with it Fasana harbour. They are of marble, of little elevation, and covered with fine underwood and aromatic shrubs. Numerous rocks and shoals lie outside of them. The lesser Brioni has the form of a horse-shoe; its south side forms a bay in which coasting-vessels anchor in 5 fathoms, muddy bottom, and are well sheltered by the greater of the two islands. Westward of the lesser Brioni there is a group consisting of five islets and three shoals; among the latter is Cabula, a bank, awash, which should be carefully avoided by vessels bound to Fasana channel. Small vessels may safely anchor in 4 to 5 fathoms in a bay on the west side of the greater Brioni, *i.e.*, between it and Madonna islet.*

Water may be procured from a pond on the larger Brioni.

A group of four small rocks lies at a short distance westward from the greater Brioni. There is a depth of about 5 fathoms among them, excepting between Levanghe, the largest and only one wooded, and Galera, where the depth is little more than 5 feet.

FASANA HARBOUR.—This is formed by the channel between Brioni islands and the coast. In the north portion of it a considerable number of vessels of any size may find shelter from all winds; the south portion, although of sufficient depth, has bad holding-ground, consisting of a bed of rocks, which unites Brioni islands with the coast. Large vessels should anchor in about 10 fathoms, mud and shells, in the centre of the channel, the east extreme of the larger Brioni bearing about S. $\frac{3}{4}$ W., and Fasana village S.E. by E. $\frac{1}{2}$ E. Small craft generally anchor at a short distance from the village bearing about S.E. by S.

Neither water nor provisions are to be obtained here. A great quantity of fish may be caught.

DIRECTIONS.—It is customary to pass to the northward of Brioni islands on the way to Fasana. In working up, a vessel may safely stand

* See Plans of Fasana and Pola harbours, Brioni islands, No. 202; scale, $m = 3.5$ inches.

close to the shore. Cabula shoal, already mentioned, is the only danger, and may be avoided by keeping to the northward of a line joining St. Marco rock, which lies about half a mile N.W. $\frac{3}{4}$ W. from it, and the north extreme of the lesser Brioni.

The shores in the vicinity of Fasana are generally low, well wooded, and cultivated. Dignano village, which is on a hill, and the clock-tower of which is visible at a considerable distance, helps to point out the position; it is about 3 miles E. by N. from Fasana channel or harbour.

ANCHORAGE.—Vessels may anchor anywhere to the southward of Brioni islands, and between them and cape Compare in about 21 fathoms, muddy bottom, but they will be exposed to southerly winds.

PORT POLA is an exceedingly fine basin surrounded by hills, and in which a great number of vessels of any size may anchor secure from all weather. The bora seldom blows with much strength here.*

The entrance, which is open to the north-west, is between Cristo point northward, and the rather elevated steep, Cape Compare. About $1\frac{1}{2}$ mile within the entrance are three islets near point Monumenti, a bluff, rounded, peninsula on the north side. These are St.^a Caterina, which is low and small, with a tower on its centre; St. Andrea, which is large, rather elevated, and has a battery and some ruins on it; and the very low St. Pietro islet, which is surmounted by a battery, and is only about a few fathoms from the south shore.

The harbour is on the east side of the islets near point Monumenti; it is divided into two by Olivi, an elevated rounded islet covered with olive trees, and a rocky shoal north-eastward of the islet. There is a passage of 6 fathoms between Olivi and the town.

The anchorage is good in every part of the harbour, and the entrance easy; the best berth is westward of the town and to the southward of Olivi in 13 fathoms, very tenacious mud, or on the north side of this islet opposite Aguzza point. Small vessels moor to the town quays.

Pola town is one of the most ancient towns of Istria, and several interesting Roman remains, particularly the amphitheatre of massive blocks of marble, are still visible. This port is likely to attain fresh importance, since the Austrian Government has decided to make it a naval station and port of war. Extensive fortifications for its defence have been erected, numerous detached forts on the heights around, and batteries on the islet of Sergio Grande, which command the entrance, crossing their fire with others along the shore. The construction of roads and drainage of the surrounding land have also been completed, and a dockyard commenced near the upper end of the harbour, below the rock

* See Plans of Fasana and Pola harbours, Brioni islands, No. 202; scale, $m = 3.5$ inches.

which bore a castle of the Venetians, and before them, of the Romans. In 1859 a floating dock, capable of receiving a line of battle ship of the largest size, was established here.

Water is abundant; a supply sufficient for a fleet may be procured from a spring—called the Roman baths by the inhabitants—near the beach, about 2 cables from the town; and elsewhere.

POLA ROAD.—The road is between the islets near Monumenti and the entrance. It is sheltered seaward by Brioni islands and cape Compare. The anchor should be dropped nearer to the south than to the north shore, as strong westerly winds occasion a considerable sea on the latter. The best berth is in 16 fathoms, mud, between St. Andrea islet north-eastward, and the southern shore.

LIGHT.—A *revolving* light on cape Compare shows a bright face every *half-minute* between the bearings of N.E. $\frac{3}{4}$ E. and S.E. $\frac{1}{4}$ E. It is 42 feet above the sea, and the bright glare is visible at 12 miles; the light in the interval is seen at 6 miles.

DIRECTIONS.—There is but one passage to Pola harbour for large ships, *i.e.*, between St. Andrea and St. Pietro islets.

The land about Pola is generally very low, and the only remarkable points near the entrance are capes Compare and Brancorso, which are steep, and the highest points on this part of the coast. The latter is 8 miles north-eastward from Promontore, and may be easily recognized from its being the first rather elevated land to the northward of it.

On approaching the harbour the square fort, the town, and the amphitheatre will be seen at the bottom of the bay; these should be steered for till the passage between St. Andrea and St. Pietro has been opened. A vessel prevented by contrary winds from entering, may anchor in 22 fathoms, mud, under the land between the two capes.

The COAST, south of Brancorso, is quite uncultivated and gradually decreases in height towards Promontore point. There is generally a depth of 22 fathoms at about one-third of a mile from the shore. There are several small bays which afford shelter from off-shore winds; the most important of these are Ports Veruda and Olmo.

PORT VERUDA.—Veruda is about $3\frac{1}{2}$ miles south-eastward from cape Compare, and is formed by two narrow bays, bordered by hills of moderate elevation. The passage to Cogoglie, the eastern bay, is narrow and access is at times difficult; the bay northward is therefore to be preferred: here vessels anchor with Mount Galera, N.E. by E. in 4 or 5 fathoms, hard mud, and are well sheltered from all winds.*

* See Plan of Port Veruda, No. 1,558; scale, $m = 2\frac{1}{8}$ inches.

A vessel prevented by contrary winds from entering Port Veruda may anchor in about 23 fathoms, sand, shells, and mud, between Veruda island and St. Giovanni point.

Water.—Excepting fire-wood, bad water is the only resource at Veruda : it is obtained from wells at the eastern extremity of Cogoglie bay.

DIRECTIONS.—Veruda islet lies at the mouth of the two bays forming the port, and may be recognized by a monastery on its summit. Two other islets are to the southward of it, and are united to the coast by shoal water. The passage is between Veruda and St. Giovanni point northward. Promontore point will help to indicate the position to vessels from the southward, and Capes Compare and Brancorso to those approaching from the northward.

PORTS OLMO GRANDE and OLMO PICCOLO.—Bombista point close to the southward of the two islets near Veruda, is the north extreme of these small anchorages. Olmo Grande is a narrow inlet affording shelter from all winds to vessels drawing not more than 16 feet. Olmo Piccolo to the southward, is exposed on all sides, and suitable to boats only.

PROMONTORE POINT forms the south extreme of Istria. It is a low, narrow, hilly point, which it is difficult to distinguish at a short distance, especially when the atmosphere is not very clear. A vessel would be liable to run upon one of the numerous dangers southward of this point before perceiving it, if the high lands eastward and northward, and the light on Porer rock by night, did not afford warning.

LIGHT.—Promontore point light is on Porer rock, which lies about one mile S.W. by W. from it : it is a *fixed* white light 111 feet above the sea, which can be seen at the distance of 15 miles : the height of the building is 88 feet.*

DIRECTIONS.—It is customary for vessels bound to Venice, or to the coast of Venice, to make Promontore point. On approaching from eastward in clear weather, the steeples of the three villages Sissano, Medolino, and Promontore will be seen in succession ; when arriving from the opposite quarter the steeple and village of Promontore alone will be visible.

The currents are often rendered very rapid in the vicinity of Promontore by streams which descending from the Gulf of Quarnero, form strong eddies on meeting the regular ebb-tide of the coast.

Felonega rock is between Porer rock and Promontore, from which it is only about one cable distant.

PERICOLOSA (or, *dangerous*) **SHOAL.**—This shoal lies $1\frac{1}{2}$ mile S. by E. from the light on Porer rock, and has a depth of 10 feet : at about one

* See Chart : Adriatic Sea, Quarnero Gulf, from Promontore to Grossa I., No. 2,711 ; scale, *m* = 0·4 inch.

cable to the southward of it the depth is 19 fathoms. There are two other rocky shoals between Pericolosa and Porer, which also have deep water at a short distance from them.

GULF of MEDOLINO.—This is formed by Promontore and Merlera points: it affords some well-sheltered anchorages, but numerous rocks and shoals render access difficult in unfavourable weather. The best of these anchorages are the following:—

Port Rosso is about three-quarters of a mile south-westward from the east extreme of Promontore: it is in a bight of the coast, protected from sea winds by Cielo and Fenara rocks, and has a depth of 4 fathoms, muddy bottom.

Port Biexzi is a small bay north-westward, which is open to the southward, and has a depth of $3\frac{1}{2}$ fathoms.

Ports Castello, Ronzi, Medolino and Pomer are small anchorages near the bottom of the gulf, which are suitable to coasting-vessels only. The passage to them is about 2 cables wide, with a depth of 3 fathoms to 4 fathoms.

Vessels occasionally anchor between Cielo and Trombon rocks, in 11 fathoms good holding-ground, and make fast to Cielo.

DIRECTIONS.—There are three passages to the various anchorages in the gulf of Medolino, in taking any one of which the numerous rocks and shoals may be avoided. The first, which is usually preferred by vessels visiting Rosso, is between Promontore and Fenara rock. Mid-channel should be preserved by steering for Cielo, and when the entrance to the port has opened out, the passage either between Golovaz rock and the coast, or to the northward of this rock should be taken, according to the wind. The anchor should be dropped a little beyond Golovaz.

To proceed to the anchorage between Cielo and Trombon the passage between St. Marina and Cielo is generally taken, and the anchor cast just beyond the latter. This passage presents no difficulty, and should be used by vessels bound to the anchorages at the bottom of the gulf. If the passage leading to Rosso should be taken, the shore should be closed, on arriving abreast of this port, to avoid Sorcio, a nearly dry shoal, $2\frac{1}{2}$ cables westward from Cielo rock. There is also a passage between Levano and St. Marina rocks: care should be taken to keep in mid-channel, in order to clear the shoals on the north-east side of the latter. It is difficult to procure good water at any of these anchorages, and provisions are unobtainable.

MERLERA POINT, the western extreme of the entrance to Quarnero gulf, is 4 miles north-eastward from Promontore: it is a low, bare, point of bold approach.

CHAPTER VII.

EASTERN COAST.—QUARNERO GULF AND ISLANDS.

VARIATION, $13\frac{1}{4}^{\circ}$ to $12\frac{3}{4}^{\circ}$ West, in 1861.

QUARNERO GULF washes the eastern coast of Istria on one side, and the entire seaboard of Hungary and Croatia, and the coast of Dalmatia, nearly as far as Nona town, on the other. It extends southward to Bianche point of Grossa island, and south-eastward to Brevilacqua strait. It contains numerous islands, rocks, &c., and shoals, of which only the most important to general navigation will be described.*

EASTERN COAST of ISTRIA.—This coast includes the space between Merlera point and Fiume, an extent of 35 miles, and presents mostly a wild, desolate appearance, consisting, as far as the eye can reach, of extensive forests, with a few intervals of cultivated patches; the sides of Monte Maggiore and the vicinity of Fiume supplying nearly the only exceptions to these features. The high lands of the peninsula are chiefly on this side, and are ramifications of the Julian Alps. Monte Maggiore, or Caldero, height 4,708 feet, and Mount Slaunig, are the elevations most remarkable for the abruptness with which their eastern sides rise from the midst of the hills which branch off from them, and which gradually decrease in height as they approach the south.

The coast is generally rocky, precipitous, and of forbidding aspect; it affords among its indentations but a few narrow bays, unsuitable to large vessels; there are no dangers within half a mile of it, at which distance the depth is ordinarily 18 fathoms, muddy bottom.

In fine weather the ebb and flow of the tidal wave are regular; at other times the degree of irregularity, caused in a great measure by the channel, among the numerous islands, depends upon the force and direction of the wind.

The bora is the wind most severely felt in this gulf, as well as on the western side of Istria, and scarcely a blade of grass will grow on spots fully exposed to it; but it is the less dangerous to vessels, as it blows either off the shore or parallel with it. Strong south-easterly winds roll in a considerable, but not dangerous, sea.

* See Admiralty Chart: Quarnero gulf; Cape Promontore to Grossa L., No. 2711; scale, $m = 0.4$ inch.

The passage up the gulf, the shores of which are bold, is easy, and a large fleet might work within half a cable of either side, but frequent heavy gales prevent its navigation from being considered safe.

The chief points of recognition, on approaching Quarnero gulf from south-eastward, are Mount Osero, height 2,230 feet, near the northern end of Lossini island; afterwards Monte Maggiore, and then Promontore point. Mount Osero is easily recognized by its naked conical white top, and signal staff. Maggiore, which rises above its surrounding elevations, and is visible at a great distance, has a conical, forked, summit. Promontore is formed by a number of low hillocks, mostly covered with bushes, which, in clear weather, are first seen on the horizon; and at a mile south-westward from it is Porer point, upon which is a lighthouse. The tops of both Osero and Maggiore are clouded shortly before and during sea winds, especially south-easters, and become clear suddenly at the cessation of them.

PORT CUË is a little bay beyond Merlera point, and is suitable to small vessels only. The point at the left of the entrance is shoal, and a bank of rocks, some of which are just above water, lies close to the northward of the east extreme of Merlera point, extending nearly half a mile from the shore, and in the way of vessels bound to Cuë.

PORT BADO.—Between Cuë and Zuffo point the coast is high, steep, and well wooded. Northward of Zuffo is a deep inlet, surrounded by high land, called Port Baddò, in almost every part of which coasting vessels, loading with firewood, anchor in about $5\frac{1}{2}$ fathoms. Water may be obtained.

In going to Baddò, the high Zuffo point should be hugged to avoid a rocky shoal, the centre of which uncovers with the tide, and which lies about $4\frac{1}{2}$ cables from the shore.

VIGNOLE BAY, about 2 miles northward from Baddò, affords shelter to small vessels in westerly and northerly winds, but is quite exposed on the south and the east quarters.

A rock, part of which is nearly awash, lies at the middle of the entrance.

ARSA CANAL.—This natural canal or inlet, 9 miles long by 2 miles wide, has several good anchorages for vessels of moderate draught, which ascend as far as Traghetto. South-westerly winds send a sea into the entrance, which, however, is not felt beyond Castel Vecchio. It receives the waters of the Arsa river, the source of which is Lake Gessaro, at the foot of Monte Maggiore.*

* See Plan of Arsa Canal, Adriatic Sea, No. 1,915; scale, $m = 2.5$ inches.

Vessels may anchor on both sides of the channel, but as the depth increases rapidly towards the middle, bora squalls would in all probability cause the anchor to drag considerably before bringing up, and it would therefore be advisable to lay out a cable north-eastward to the shore; for this reason vessels anchoring in the open channel should prefer the starboard side.

Port Lungo di Carnizza.—This is the outermost port in Arsa canal; it is surrounded by high land, and has a depth of about $5\frac{1}{2}$ fathoms, muddy bottom. It is seldom visited except by large boats loading with firewood. The best berth is off the village. Water may be obtained at the upper part of the port.

Port Gradas, which is on the starboard hand more than 2 miles from the entrance, is the best harbour in the canal; it has a depth of $6\frac{1}{2}$ to 8 fathoms. Ubas point serves to indicate the entrance to Arsa. It is a high tongue of land covered with wood, and of whitish appearance near the sea.

NERA POINT, $8\frac{1}{2}$ miles beyond Ubas, is of considerable elevation, very thickly wooded, and visible at a great distance, as is also Mount Ostrine, 1,760 feet high, from which it is a spur. Between Nera and Ubas points are two small bays open to the southward, but sheltered from all winds between west-north-west, and east-north-east.

A vessel should not anchor nearer the shore than 11 fathoms, in order to avoid rocky bottom, especially in the westernmost of the two bays.

PORTS MARINA and LUNGO are two small bays about $4\frac{1}{2}$ miles from Nera point. The former is open to the southward, and too shallow for any other vessels than coasters; the latter has a depth of 22 fathoms, good holding-ground, but its entrance is too narrow to be taken, excepting by small vessels.

Into both of these bays southerly and south-easterly winds send a heavy sea; and it is necessary to secure to the weather shores against violent bora squalls. There are no villages here, and no water is procurable.

PORT RARAZ, about 1 mile from Lungo, affords shelter to coasters from westerly and northerly winds in good holding-ground. Southerly and south-easterly winds are severely felt, and the bora reaches it in violent gusts. There are a few houses on the beach. This anchorage serves as a port to the ancient town Albona, situated on an eminence about one mile to the westward of it.

Water may be obtained in abundance at a spring.

PORT FIANONA.—Between Nera point and this port, distant about 16 miles, the coast is precipitous and thinly wooded. Fianona is formed

by a creek a little more than 3 cables wide, and extending nearly 2 miles north-westward. The soundings are 27 fathoms at the entrance, to 5 fathoms, muddy bottom, at the upper and narrower part, where Fianona stands on a hill, the site of the ancient town of this name. This port is open to the south-east, and visited by heavy bora squalls, against which it is customary to secure by laying out cables to the shore. Fianona and Rabaz are the two chief places of export for the produce of the eastern side of the Istrian peninsula. From seaward the position of Fianona appears like a deep cutting in the mountains.

Water is plentiful, and provisions may be procured.

PORT PRILUKA.—Between Fianona and this port, at the northern angle of the Quarnero, there are about 15 miles of coast, which present a less desolate appearance than that which has been described. A few villages and patches of cultivation are visible, especially on the slopes of Monte Maggiore and in the neighbourhood of Fiume. It is almost everywhere high, with an abrupt coast line bordered by deep water, and without any shelter, excepting little boat creeks, protected by moles.

The space afforded by Port Priluka is not more than sufficient for a few coasters. Its position, which otherwise is unmistakeable, is indicated by the small town Castua, near which is a white castle on an eminence.

FIUME ROADSTEAD lies abreast of the town. The violence of bora gales renders it unsafe in the winter, and although the fetch is not more than 10 or 11 miles on any quarter, a heavy sea is sent in by winds from the south-east quarter whenever they blow directly through the passage between Cherso and Veglia islands. Large ships should anchor in 20 to 24 fathoms, about three-quarters of a mile from the town, westward of the river's mouth, between the latter and an extensive sugar-manufactory. The holding-ground is excellent, and the bottom shoals gradually towards the shore, at $1\frac{1}{4}$ cable from which the depth is 10 fathoms. The hawse should be open to both the north-east and south-east, in preparation for either a bora or a south-east gale; and it would be, therefore, prudent to moor with a swivel on the cables. Mount Viscevizzo, which is in the rear of the town, is a good guide to this anchorage.

FIUMARA RIVER, the mouth of which is to the right of a tower, and close to the eastward of the town, is enclosed between two moles, and serves as a port, bordered by quays, for a great number of small vessels of not greater draught than 5 feet, which anchor outside and warp in stern foremost, as the breadth within does not admit of turning. Its current is sometimes very rapid. At the mouth of the gorge of the

Fiumara stands an extensive paper manufactory, conducted by Messrs. Smith & Co., Englishmen, and employing 250 people ; a great part of the paper used in the Levant is supplied from hence.

FIUME (Illyrian *Reka*, Germ. *St. Veit am Flaum*) is one of the most important commercial towns in the Adriatic, and is the chief outlet for the produce of Hungary. Extending about a mile along the sea-side, and containing several imposing edifices, with high land in the background, it presents a picturesque appearance. Population, 11,000. A good road is carried over the Julian Alps to Carlstadt, where the navigation of the Save and Culpa becomes available.

Supplies.—The water of the river is of excellent quality and the best at Fiume. Watering-boats can always enter the river with safety, even when a strong south-easter occasions a heavy surf on the shore, and go above the vessels. Eighty tons have been thus procured by a frigate in twenty-four hours, the casks remaining in the boats. Provisions of all kinds are good and plentiful. There are several ship-building yards.

A *fixed* white light 28 feet above the sea, and visible at 4 miles, is on the extremity of the outer mole.

PORT MARTINSKIZZA is a short distance south-eastward from Fiume, of which it is the quarantine port; it has an entrance rather less than 2 cables wide, whence the soundings decrease from 17 to 7 fathoms, at about two-thirds of the way to its upper part. Vessels moor along the eastern shore on account of the bora. Supplies are plentiful, close to the beach. There are two ship-building yards.

DIRECTIONS.—The starboard point of the entrance should be avoided to keep clear of a rocky shoal which shelters the port in a great measure from southerly and south-westerly winds. The entrance is easily recognized by the high point on the starboard hand, and by a hill, on the summit of which is a small chapel.

PORTO RE is about 11 miles south-eastward from Fiume, and has one common entrance with Buccari bay, between two rather elevated jutting-out points, about $4\frac{1}{2}$ cables apart. It is, although small, commodious, and sheltered from all but north-westerly winds, which send in a considerable sea ; the depth in the middle is 12 fathoms good holding ground. Porto Re is preferred, even by large vessels, to Fiume road. It is defended by a battery. Water is with difficulty procured, and provisions are scarce at the town, which lies at the bottom of the port.*

BUCCARI BAY.—This bay lies north-eastward of Porto Re, which is passed in proceeding to it. It is a nearly land-locked basin, with suffi-

* See Plan of Porto Re, No. 1,677; scale, $m = 1\cdot8$ inch.

cient space for a considerable number of vessels of any size. It is customary to moor on the north side near the town, or off Buccarizza village, where they are best sheltered from the bora, which sometimes reaches the anchorage suddenly and with great strength. The town is fortified, and communicates with Fiume by a good road. Water is abundant, and provisions may be obtained.

• **DIRECTIONS.**—A castle is on the right of the entrance to the bay in which both Porto Re and Buccari are situated, and may be seen a long way off. The eastern extreme, Ostro point, is shoal. The western shore of the Gulf of Quarnero having been defined, the remainder of the Hungarian coast will be included with the opposite shore after a description of the islands and channels of the gulf.

CHERSO ISLAND.—This island forms with Istria the widest of the Quarnero passages. Its shores are more or less high and rugged, excepting near the south extreme. The east side has few inhabitants, and extensive forests with barren wastes are only occasionally interrupted by houses and patches of cultivated ground. The west side has a less desolate appearance; the north end, which is high, is studded with villages, and has a few small ports which afford shelter to small craft from the bora. The soundings are generally considerable within 2 or 3 cables of the shore, and excepting a few shoals which will be described, there are no obstacles in the vicinity of the island to the navigation of vessels of the largest draught. The highest point is Mount Cis, 1,680 feet; near the centre of the island is Mount Chelm, which is of rather less elevation.

It is inadvisable to sail near the eastern shore on account of the bora; the opposite side of the island is sheltered from this wind, and has several ports and safe anchorages. Strangers may take warning of a coming bora gale, by observing all the small craft hastening to the nearest places of shelter.

PERNATA POINT.—This is the most remarkable point of the coasts of the island; it is elevated, and abreast of Nera point of Istria. Between it and St. Biagio point to the northward is the spacious Cherso bay.

CHERSO BAY is protected in a great degree from all but northerly winds; vessels moor along, at 2 or 3 cables from, the eastern coast in about 26 fathoms, good holding-ground. Small vessels find shelter in various creeks on the same side.

PORT CHERSO.—This small, yet excellent port on the east coast of the bay, is entered by a long passage little more than 2 cables wide; the depth in the middle is 11 fathoms, mud. The best berth is abreast of a monastery south-eastward of the town. Vessels of moderate draught

anchor nearer the shore, to which they secure against the bore. There is a small basin, around which the town is built, to which small craft resort. Cherso town has about 4,000 inhabitants.* There is a spring of fresh water south-eastward of the port; provisions are procurable. There are two or three yards for the repair of vessels.

PORT ST. MARTINO, 8 miles southward from Pernata point, is open to the southward, and a considerable swell reaches it in south-westerly winds. The best anchorage has a depth of 10 to 13 feet, mud, and is abreast of a monastery, which is visible afar off.

Lavrera islet, which lies off the bay, and affords it some protection south-westward, is not of bold approach, excepting on its south side; between it and Cherso is a small round rock.

OSERO CHANNEL is the space between Cherso and the north-east shore of the Isola dei Lossini; it affords good anchorage for vessels of any size. The depth in the middle is 22 fathoms, hard mud, and the best anchorage is a mile northward from the town. In entering the channel, Osero point the northern extreme of Lossini, which is shoal, must be avoided.

Osero town, ancient *Absorus*, is now nearly uninhabited, owing to its insalubrity. It is on an eminence close to Lossini island, and a swing-bridge forms a communication between them. Here, the beautiful white limestone which has been so largely employed at Venice is quarried. A strong fort defends the narrow passage, which can be taken only by vessels of very light draught. Water and provisions are scarce, but may be obtained.

Camisa Bay is in Osero channel, and 3 miles northward from the town. The best berth is in the northern or upper part of it; the depth is generally about 7 fathoms, muddy bottom.

PUNTA CROCE CHANNEL.—This passage between Cherso and Lossini islands is no more than 13 feet wide, abreast of Osero town, at the northern extreme, with a depth of little more than 3 feet: the two shores gradually diverge southward, leaving a southern entrance of $3\frac{1}{2}$ miles wide. The length of the channel is 7 miles; the depth shoals gradually northward from 55 fathoms at the southern entrance, and the bottom throughout is mud.

Small vessels anchor in Martinskizza, Caldonta, and Scoglich bays; the open channel is too much exposed to south-easterly winds and sea to admit of safe anchorage in it.

To enter this channel vessels should pass either northward of Palazzoli rocks, keeping close to Croce point, the south extreme of Cherso, or

* See Plan of Port Cherso, No. 1,677; scale, $\frac{1}{8}$ inch.

westward of them, keeping in mid-passage to avoid a 3 feet shoal, which lies rather more than one mile north-westward from them. It is advisable not to pass within 2 miles of the largest of Palazzoli rocks.

CROCE POINT.—The eastern coast slopes gradually southward towards this point; the shore is rocky and inaccessible. The point itself is very low, and bordered by shoals; it forms several small bays, of which St. Andrea alone has sufficient space for small vessels.

ISLETS, &c.—Terstenich is a rocky islet $2\frac{1}{4}$ miles north-eastward from Colerat point, which may be considered a part of the land forming Croce point. The islet, which is clean around, is cultivated, and upon it are several houses.

Ciutin rocks are two rocks near the shore, 7 miles northward from Colerat point; there is a depth is 4 fathoms in shore of them.

Plaunich islet lies about 5 cables eastward from Lukovo point, and extends $3\frac{1}{2}$ miles from north-west to north-east; it is uninhabited, and overgrown with grass. The depth between it and Cherso is 47 fathoms.

Three rocks lie near Plaunich; one close to it north-eastward; and the two Corbanaz rocks, which are about one mile south-eastward; the latter are united by a shoal, and between them and Cherso the depth is 9 fathoms.

LOSSINI ISLAND consists of elevations united by low isthmuses, and at a distance presents the appearance of three islands. The north part is hilly and barren, and near the middle of it is Mount Osero, in the form of a cone, 2,230 feet above the sea, upon which is a signal station, and which is one of the chief sea-marks in this part of the Adriatic. Mount Calvario, which has a church on its summit, is near the middle of the south part of the island, which generally, is well cultivated, and contains the greater portion of the 11,000 inhabitants. Here many flocks, the wool of which is exported, find pasture; and the vine and the olive are grown in abundance. The depth of water is generally considerable around the island.

The East Coast is mostly high and of irregular outline.

PORT LOSSINI GRANDE.—This is a little bay on the east coast, which is open to the north-west, and has sufficient space for small vessels only; the village which is on a hillock points out the position. Northerly and easterly winds occasion a heavy sea at the entrance.

ANCHORAGE.—The Oriuli are two rocky islets united by a shoal, which lie half-a-mile from the south-east extreme of Lossini. There is good anchorage between them and the island in 22 fathoms, mud and sand. The best berth for large vessels is between the greater rock and the island, whence they may lay out a cable to the shore north-eastward against the

bora; small vessels may anchor south-westward from the smaller rock, where the depth is less.

There are a south-east and a north-west passage to this anchorage, both of which are safe. A rocky bank awash lies nearly 3 cables eastward from the north extreme of the smaller rock or islet.

The Western Coast is similar to the eastern, but still more irregular; it has several good anchorages.

PORT CIGALE is a well sheltered little bay $4\frac{1}{2}$ miles from the south-east extreme of Lossini which is frequented by coasting vessels. It extends inward about half-a-mile, and its entrance which is not quite $1\frac{1}{2}$ cable wide, is open to the westward. The depth is 9 to 12 fathoms, in the middle, which is in some measure protected from the sea of westerly winds by a shoal of 7 fathoms, which lies abreast of and half-a-mile from the entrance. There is a church on the starboard point.*

PORT AUGUSTO or LOSSINI PICCOLO is a long narrow bay at the least elevated and most contracted part of the island, and about 2 miles north-westward from Cigale. It is about 3 cables wide; extends 3 miles from north-west to south-east; is without any dangers, and is considered one of the best and most conveniently situated ports in the north part of the Adriatic.*

Vessels anchor in any part in 6 to 23 fathoms good holding-ground, but the north-east side, not far from the outer houses of the town, is usually preferred on account of the bora; as the entrance is very narrow, it is advisable to choose a berth with some reference to the wind with which the port will be quitted. Close proximity to the rocky north-east shore of Colludarz island, and also to the north-east shore of the port abreast of the outer houses of the town, should be avoided.

Supplies.—Water and provisions may be obtained; the former from some springs at the north-west extremity of the port: there are two inferior watering-places to the southward; one of these has usually a depth of 3 feet excellent water, but it must be drawn from a well 20 feet deep, and boats cannot approach within half a cable of the shore. Population, 3,000.

DIRECTIONS.—When bound to Augusto, the lowest part of the island should be steered for, and at a near approach the town, which is on an eminence at the bottom of the port, will be plainly seen. The passages between Zabodaski and Mortar rocks, and between the north-west extreme of Colludarz and the bluff Tornuza point should be taken. The

* See Plans of Ports Augusto and Cigale (Lossini island), No. 1,561; scale, $m = 2.4$ inches.

space between the south-east extreme of Colludarz and Lossini is called *Bocca falsa* (false entrance), being closed by a reef of rocks.

The outside channels are all wide and clean, excepting between Unie and Canidole, in the middle of which a sunken rock is said to lie; but there is a good channel on either side.

ARTATORE BAY.—Temporary refuge may be taken in this bay between Zabodaski and Tornuza point, when the bora prevents entrance to Augusto. But care must be taken to quit it before being detained by southerly winds, to which it is quite exposed, and which are fair for entering Augusto.

BIANCA POINT.—This is the most salient point of the south-west coast of Lossini; shoal water extends to a short distance from it, both southward and westward.

ASINELLO and St. PIETRO di NEMBO ISLETS.—St. Pietro is of bold approach; it is covered with wood, and a church stands upon its west extreme. The passage between it and Lossini is divided by Cosiach rock, and has sufficient depth, but the current is too rapid to permit its being safely taken without considerable caution. Close to the southward is Asinello islet.

A rocky 5 feet bank lies near the shore about $1\frac{1}{2}$ mile westward from Radovan point of Asinello. Gruizza shoal, which has a depth of 4 fathoms, is mid-way between Asinello and Gruizza rock, which latter is itself surrounded by shoal water to a distance of nearly 4 cables. A third rocky bank, the Levante, of less than 6 fathoms, is one mile south-eastward from the same rock.

PORT St. PIETRO di NEMBO.—This is an anchorage for vessels of moderate draught in the channel between St. Pietro and Asinello; it is abreast of the ruins of a castle on the shore of the former.*

Water may be obtained at the village, and also near the castle ruins.

The south-east passage, which is easily recognized by the long, low, whitish Radovan point, is the better of the two when the wind is favourable. In taking the north-west passage, which is indicated by a church near some white cliffs on the port hand, mid-channel should be preserved, as both shores are shoal.

UNIE ISLAND is the westernmost of the Quarnero islands, and forms, with Lossini, Unie channel. It is of irregular elevation, chiefly low and covered with grass and brushwood. It has about 300 inhabitants, produces good firewood, and has a considerable fishery. All the projecting parts are bordered by shoal water.

* See Plans of St. Pietro and Unie; No. 1,776, scales, $m = 1.3$, and $m = 2.2$ inches.

UNIE BAY, or ROADSTEAD.—Vessels of the largest size can here take temporary shelter. It is open to the north-west; the best anchorage is in 9 fathoms, sand, north-eastward of Islotto, an islet off Pogle point, the south extreme of the bay; here there is good shelter from all winds from the east half of the compass. The south side of the bay is bordered by shoal water, within which is Islotto.*

PORT LUNGO is a large bay on the east side of Unie island, and has a depth of 4 fathoms. It is quite exposed to south-east winds, which send a considerable sea into it, but affords good anchorage against westerly and north-westerly winds. The position of the bay is marked by a tower on the peninsula point, forming the starboard side of the entrance.

CANIDOLE ISLETS.—These are three low, partly wood-covered rocky islets, two large, and one small, which lie one mile south-eastward from Unie; between them and the latter there is a safe passage, in the middle of which the depth is 12 fathoms. A vessel taking this passage should beware of a small awash rock nearly 2 cables from Grossa point, the south extreme of Unie. There is a depth of 9 fathoms about half a cable outside of it.

ANCHORAGE.—There is good shelter from a bora at a short distance south-westward from the Canidole in 19 to 22 fathoms, sandy bottom. Shoal water extends to about half-a-cable around them.

UNIE CHANNEL.—This large and nearly land-locked space between Unie and Lossini islands affords a safe refuge to numerous fishermen of this part of the Adriatic, who affirm that a large fleet might here ride out a gale of wind in complete security. The soundings are very regular; about 27 fathoms, muddy bottom.

SANSEGO ISLE.—This is the south-westernmost of the Quarnero islands; it is about mid-way between Grosso and Promontore lights, and is usually made by vessels on their way to sight Promontore before proceeding northward. Its height is 350 feet, and it is crowned by a church; it appears flat at a distance, and has a sandy soil. On the eastern slope of Mount Garba 350 feet high, near the middle of the island, are a village and a church. There are about 200 inhabitants on the island; wine and fruit are the chief products.

The coasts are steep, and of bold approach, excepting south-eastward between Suka and Giesni points, where there is a reef which is nearly awash. Rocky shoals lie about 3 miles north-westward and south-west-

* See Plans of St. Pietro and Unie, No. 1,776; scales, $m = 1.3$ and $m = 2.2$ inches.

ward of the island, and although the least depth is nearly 6 fathoms, it is advisable to keep clear of, to avoid the heavy sea on, them, and which in some parts occasionally breaks.

ANCHORAGE.—Vessels anchor 5 and 6 cables from the south-west shore of the island in 19 fathoms, sandy bottom, with Sansego village bearing about E. by N. This anchorage is useful in a bora gale. A rocky patch of 12 fathoms lies about half-a-mile southward from it.

DRAGACCI BAY, which is suitable for small vessels only, is westward of Arat point, the eastern extreme of the island. It is in some measure sheltered from the sea of easterly and northerly winds by a rocky shoal of 6 fathoms, which lies about 2 cables north-eastward from the point.

“ There is also good anchorage against northerly winds in 28 fathoms, mud, on the east side of Sansego, about $2\frac{1}{2}$ miles from the nearest shore, the extremes bearing W. by N., and S.W. by S., and Premuda, S.S.E. $\frac{3}{4}$ E. This spot is exposed to southerly and north-westerly winds ; the soundings from it towards the houses on Sansego, shoal gradually to 5 fathoms, sand, near the bay, at the head of which is a watering place ; the water is brackish and not easily procured.”*

GRAND QUARNERO CHANNEL.—This channel, formed by the east coast of Istria on the one hand, and Lossini, Unie, Cherso, and Sansego islands on the other, is of safe navigation with reference to rocks and shoals. The narrowest part, between Nera and Pernata points is 6 miles wide, and the two shores have deep water close to them ; the only danger lies at the mouth or widest part, viz. :—

Gallola Isle.—This small very low rocky islet lies $4\frac{3}{4}$ miles north-westward from the north extreme of Unie island. It is surrounded by shoal water, and is not easily perceived, especially when the weather is rather obscure.

The bora is often very violent and dangerous in this channel, and vessels are obliged to anchor at once wherever they happen to be, or to bear up for shelter under Promontore point, or for one of the ports in the neighbourhood. This wind undergoes remarkable shifts ; northward, it usually follows the direction of the channel ; toward the middle it veers to the eastward, and it gradually becomes northerly again as the shore of Cherso is approached.

*“ Standing for the bay on the south-west side of Unie, we had soundings from 20 to 23 fathoms ; after passing the small island represented in the chart, the water shoaled suddenly to 12 and 18 fathoms sand, with

* Remarks by Captain W. H. Smyth, R.N.

small stones and shells, and we came to in $10\frac{1}{2}$ fathoms, with a moderate south-west breeze, which shifted suddenly to a strong south-easter, when the ship drove at once into 23 fathoms clay and sand, excellent holding-ground. Here we rode out a hard north-east gale in perfectly smooth water, Promontore land bearing N.W. $\frac{3}{4}$ N."

The current is very rapid at the narrowest part, in northerly winds, when it sometimes attains a speed of 4 miles an hour. During the flood it sets to the northward along the coast of Cherso, and to the southward on the shore of Istria; during the ebb, the direction throughout the channel is southerly.

VEGLIA is the most northern and the largest of the Quarnero islands, being 20 miles long, by an average width of 7 miles, and only second to Lissa in number of inhabitants, which are estimated at 17,000, and superior in variety and abundance of produce. Of the various elevations, mount Triskavaz, near the south-eastern extreme, and St. Giorgio, near the north-east coast, are the most remarkable. The south part, is lower and more fertile than the opposite, but a great portion is covered with woods. The island is noted for a peculiar breed of small and active horses. The gentle slopes of the higher parts afford pasturage which is highly esteemed; the wine is the best produced in the Quarnero, and the olive, and various fruits, grow luxuriously.

The north coast is high, rugged, and of whitish appearance, excepting north-westward between St. Martino point and Sottile point of Castelmuschio, where patches of cultivation alternate with woodlands. The country in the neighbourhood of Veglia town is well cultivated and of agreeable aspect, as is the south coast generally; near the south-east extreme it is rocky and barren.

VEGLIA BAY, near the middle of the south-west coast, affords anchorage for vessels of any size, in 5 to 11 fathoms, muddy bottom. Violent bora squalls reach it from the elevated valleys of mount Triskavaz, and it is advisable to anchor under the north-east shore, opposite Caneve bay, and to take every precaution against this wind.

PORT VEGLIA, in the north-west part of Veglia bay, is merely a creek, in which large boats or vessels of very light draught are protected by a mole, from southerly winds; the depth in the middle is little more than 1 fathom.

Veglia town is on an eminence; it contains 4,000 inhabitants, has a cathedral and several other important buildings, and is defended by walls and a castle. It is the chief place of export for the produce of the island.

Water.—Spring water may be obtained.

PORT CASSION, in the north part of Veglia bay, is only frequented by small craft loading with firewood, the passage leading to it having a depth of little more than one fathom. It is well protected, being nearly land-locked.

CHIAVLINA ANCHORAGE.—Vessels may anchor along the north-west coast of the island in Chiavlina bay, which lies northward of St^a Maria point. Large vessels should come to at about 4 cables from the shore, in 25 fathoms, good-holding ground. This anchorage is well protected from south-westerly winds by Cherso island, and is exposed to those from northward and from westward only.

A monastery on its south extreme, or St^a Maria point, marks the position of this bay.

MALINSKA BAY is close to the eastward of St. Martino point. Vessels of large draught anchor between two small creeks formed by jetties, one on each side of the bay, in 19 fathoms, mud, and about 3 or 4 cables from the shore. Smaller vessels which draw too much water to enter inside the jetties, anchor nearer the beach. North-westerly winds are troublesome, but although they sometimes occasion a considerable sea they are not dangerous at this anchorage.

Water may be obtained at Malinska and St^a Maddalena villages.

SASSO BIANCO BAY, northward of Malinska, is also exposed to north-westerly and south-westerly winds. The anchorage is in about 10 fathoms, muddy bottom, abreast of the small village Gnivize.

The high, rounded, and wood-covered St. Martino point, is a good mark for both Sasso bianco and Malinska bays.

CASTEL MUSCHIO BAY, near the northern extremity of Veglia, is protected by the low narrow peninsula named Sottile point, which jutting out more than 2 miles to the northward, forms its western side. It has a depth of 22 fathoms at the middle of its entrance, and the soundings decrease to 14 fathoms opposite the village; on the east side the space is sufficient for a number of vessels of the largest size, but the bora is sometimes severely felt at this anchorage.

The starboard point on entering should not be approached within 2 cables.

PORT LUCIZZA, which is about half a mile from the point on the port side of the entrance to Castelmuschio, is preferred to the latter by small vessels, which anchor on the west shore, in about 7 fathoms, securing to it against the bora.

The point forming the left extreme of the bay, has a shoal of 3 feet extending more than 2 cables southward from it.

Supplies.—Water and provisions may be procured at this anchorage.

ST. MARCO ISLET is a barren rocky islet close to the north extremity of Veglia island, which divides the passage to Maltempo channel, between Veglia and the Hungarian coast, into two. The southern passage, between it and Veglia is too narrow to be safely practicable; that between it and the coast is half-a-mile wide, has a depth of at least 25 fathoms, and is without hidden dangers.

ANCHORAGE.—There is a depth of 7 fathoms, mud, in a little bay between St. Marco and a small rocky peninsula, which forms the northern extreme of Veglia. Vessels anchor in the centre of the bay, and lay out a cable to the peninsula, on the side upon which stand a village and a church.

This anchorage is useful to vessels overtaken by a bora gale after entering Maltempo channel from westward.

DOBRIČNO BAY.—This bay, on the north-east coast of Veglia, and about 6 miles from its north extreme, affords excellent shelter for vessels not drawing more than 13 feet, which is the depth in the long and narrow passage which leads to it. A shoal of 6 feet lies about a quarter of a mile eastward from Suligna point, which forms the right extreme of the bay, and which, is itself, not of very bold approach.

STIPANA BAY.—The north-east coast of Veglia is swept by the bora, and, although there are several small indentations called ports, this bay is the only refuge from this wind for any other than vessels of very light draught. It is about $1\frac{1}{2}$ mile southward from Dobrično, and is protected by the long narrow tongue of land forming Scillo point. It is advisable to anchor in 17 to 19 fathoms, muddy bottom, near the east side of the bay, making fast to it north-eastward.

BESCANUOVA BAY, at the south-east extremity of Veglia, is completely exposed to winds between north-east and south-east, and is seldom visited excepting by small coasting vessels and boats for water and vegetables, of which there is an abundant supply. The land in the vicinity of the village is highly cultivated.

Some awash shoals lie about three-quarters of a mile from Scuglia, the south point of the bay.

PARVICCHIO ISLAND, about half-a-mile from the south-east extreme of Veglia, is hilly, barren and uninhabited. The passage between it and Veglia—Bocca di Segna—is used by vessels bound to Segna, on the coast of Croatia. Mid-channel should be preserved as the two points of the islands which are nearest each other are shoal.

The bora often blows through this passage with extreme violence, and

it is advisable to shorten sail before entering it, and to seek shelter under the lee of Veglia at the least symptom of this wind's approach.

St. Gregorio Islet, 2 miles south-westward from Parvicchio, is barren and steep-sided. In case of emergency a vessel may anchor, under shelter from easterly winds, in Port St. Gregorio on the north-west side: the depth is 17 fathoms, muddy bottom.

Golo Islet, which is half-a-mile south-eastward from St. Gregorio, is bordered by shoal water on its south and north-west sides. A vessel may anchor during a bora gale to the southward of Golo close to the main land.

ARBE ISLAND, 11 miles long by 2 miles wide, is one of the most important of the Quarnero group. A chain of hills, the highest of which, Mount Tignarossa, 1,395 feet, is near the centre, extends throughout the entire length from north-west to south-east. There are about 5,000 inhabitants. The products are wheat, wine, olives, silk, and firewood, and a great number of sheep and cattle are reared; there are marble quarries. Excellent wine is produced at Barbato, near the south-west extreme of the island.

PORT ARBE is a cove at about the middle of the south-west coast: vessels are sheltered from all winds by a jetty and a mole. The depth in the middle is 8 to 13 feet.

On entering, between Tonnera rock and the town point, the latter must not be closely approached, being shoal.

Arbe town is pleasantly situated on a promontory, which shelters the anchorage from south-westerly winds: it is fortified, and is the centre of the commerce of the island. It contains a cathedral and a collegiate church: in the neighbourhood are some salt-works.

ST. EUFEMIA ANCHORAGE is a small bay westward of Arbe town, in which small craft anchor in a depth of about $3\frac{1}{2}$ fathoms, muddy bottom.

DOLIN ISLET is a long narrow strip of land running parallel for more than 4 miles with the south-west coast of Arbe island. It is thickly covered with bushes.

BARBATO CHANNEL is the long channel formed by the shores of Dolin and Arbe, it has an average width of about one cable, and the depth in the middle varies from $5\frac{1}{2}$ to 11 fathoms, sand: the bottom near Dolin is rocky. It affords excellent well-sheltered anchorage for a considerable number of vessels of any size and draught in three places. First, about half-a-mile from the north-west entrance, just beyond Chiesa point upon

which is St^a Maria church ; secondly, a little to the eastward of the small St. Stefano church, off which a sand-bank extends to about mid-channel ; and, thirdly, at about $1\frac{1}{2}$ mile from the eastern entrance. It is customary to anchor mid-way between the two shores, and lay out a cable to the shore north-eastward.

Water.—There is a fountain with an abundant supply a short distance to the eastward of St. Stefano church.

DIRECTIONS.—The course for the north-west entrance is partly the same as that for Port Arbe and St^a Eufemia. Care must be taken to pass mid-way, in about 7 fathoms, between the north-west extreme of Dolin, and Zercagico point of Arbe, to avoid some rocks which lie close off these points. In taking the south-east entrance the little Poclub rock, which is united to Arbe by a rocky shoal of about 4 fathoms, must be left on the starboard, and the small Cantarara rocks on the port, hand.

There is a rocky bank about $3\frac{1}{2}$ cables from the south-east shore of Arbe.

PORT OMAGO is at the eastern extreme of Arbe island, and affords convenient shelter to small vessels overtaken by a bora gale in Morlacca channel. It is protected by rocks, bordered by shoals, which extend about 2 cables north-westward, and has a depth of 17 fathoms, muddy bottom.

The north-east side of Arbe, excepting Port Omago, is a straight, exposed, iron-bound, coast. The passage between Arbe and St. Gregorio is never used.

ST. PIETRO ANCHORAGE is on the north-west side of the island. It is well sheltered from all winds, and has a depth of 14 fathoms abreast of a small house on the north-east side, at a convenient distance from the shore for laying out a cable to it.

Water.—There are two good springs close to the beach.

DIRECTIONS.—Mount Sorigno is a good guide to this anchorage ; the point on which the mount stands should be closed on entering, and the south-west side of the bay, which is bordered by shoal water, should be avoided.

CAMPORA ANCHORAGE is south-westward of that of St. Pietro, to which it is inferior. The best berth is in 10 or 11 fathoms, muddy bottom, with the village, which is on an eminence on the port hand, bearing about W. by S.

The north point of the bay should not be closed, as there is a rock awash, with some shoal water off it.

SOUTH-WEST ANCHORAGES.—Numerous coasting-vessels anchor in coves formed by the south-west side of the island, between Cape Fronte and Arbe town, where they load with firewood under shelter from the bora. These places are also resorted to for temporary refuge from this wind by ordinary merchant vessels.

QUARNEROLO CHANNEL.—The chief and the most frequented of the southern entrances to this channel is between St. Pietro di Nembo, and Premuda and Selve islands; the second in importance is between Selve and Ulbo; and the next between Selve and Pago islands, which is taken by vessels bound to Zara channel.

Among the few dangers in Quarnerolo channel are the following :—

Lutostrak Rock and Shoals.—Lutostrak is a small rock near the north-west side of Premuda; there is a shoal of 11 fathoms one mile north-westward, and another of 3 fathoms, rocky bottom, less than one mile south-westward from it. The shoal of $5\frac{1}{2}$ fathoms eastward of Gruizza rock has been already described.

Selve Shoal is a dangerous rocky bank $2\frac{3}{4}$ miles from Coslina point of Selve; at its centre the depth is about 4 feet.

Palazzoli Rocks should not be approached within a circle of 2 miles radius.

Terstenisch Islet is clean around.

Lagagn and Dolfin Rocks are safe on their north-west sides.

Corbanaz Rock should not be approached within half-a-mile, on the south-west or south-east sides, which have shoals of $2\frac{1}{2}$ fathoms near them.

South-westward of Negrito point of Veglia island there are three dangerous shoals; they lie about mid-channel, between it and Corbanaz. The first, on approaching from southward is Pitic, a shoal of less than 3 fathoms, which lies 2 miles south-westward from Negrito point; the two others, called Bonde-Negrito shoals, are nearly one cable northward from Pitic shoal, and are very near each other; there is a depth of $2\frac{1}{2}$ fathoms on one, and of $4\frac{1}{2}$ fathoms on the other.

Buot Shoal.—This shoal, a little to the northward of Bonde-Negrito, is midway between Negrito point and the north extreme of Plaunich island.

Beyond these dangers, Quarnerolo channel becomes narrower, and is safe to Fiume road.

PREMUDA ISLAND, about 3 miles long, is of little elevation, especially towards its south-east extremity, and it is thickly covered with bushes, excepting in the neighbourhood of the town.

Premuda town is on the north-west side, on the slope of the highest hill of the island, and may be seen at a distance of 4 miles ; it contains about 1,200 inhabitants.

The north-east coast is precipitous, affords no shelter, and is bordered by a considerable depth of water.

Off the north-west extreme are two rocks, between which is a passage for small vessels. The larger of these, Lutostrak, and its shoals, have been already mentioned.

ANCHORAGE.—Four small rocks which extend about $1\frac{1}{4}$ miles from N. by W. to S. by E. lie nearly 4 cables from the south-west coast of Premuda, forming with it a channel in which small vessels anchor in 4 fathoms, mud, abreast of St. Ciriaco chapel, which is easily distinguished from the offing. In south-east winds the current sets rapidly through this channel and between the rocks.

Vessels of any size may anchor during a bora gale under the south-east shore of the island. Large vessels should come to, in 33 or 35 fathoms, sand, at 2 miles from the shore, near the middle of the island ; small vessels may anchor in the little Premuda bay in $5\frac{1}{2}$ or $6\frac{1}{2}$ fathoms, muddy bottom.

SCARDA ISLAND is small, low, rocky, barren, uninhabited, and covered with bushes ; the highest part is a hill near the south-east extreme. The only danger is a shoal, which is less than 2 cables from the north-west point.

The passage between Scarda and Premuda, which is more than half-a-mile wide, is frequently difficult owing to the rapidity of the current. Mid-channel should be preserved, as the opposite points of the two islands are shoal.

ISTO ISLAND is larger and higher than Scarda. Two hills, Guardia north-eastward, 72 feet high, and another south-westward, give it the appearance of two islands, when seen from south-eastward. A village on the south-west side contains the few inhabitants of this island.

The north-east shore has deep water to about 3 cables from it ; the south-west side is bordered by rocks and shoals.

There is no anchorage on any part of the coast excepting two small creeks suitable to coasters ; the creek on the east side is called Port Isto, but the depth is inconveniently great, and the anchorage is exposed.

The passage between Isto and Scarda, which has a depth in the middle of 33 fathoms, is narrow, and its navigation is rendered difficult by numerous rocks and shoals, and by the rapidity of the current. The westernmost of

the rocks south-westward of Isto and Scarda should be closed, and the whole of the group left on the starboard hand. There is a 5 fathoms shoal nearly 3 cables from the shore of Scarda.

MELADA ISLAND, which is sometimes called Zara, is of less elevation than Isto; when seen from a distance it presents an irregular outline, formed by barren or bush-covered hills, the highest of which is to the westward, near Zappontello village, and is cone-shaped. There are about 300 inhabitants, mostly mariners and fishermen.

The south-west coast is bordered by numerous rocks and shoals, rendering approach within $1\frac{1}{2}$ mile difficult.

PORT BERGUGLIE.—This port, which is formed by the south coast of the island, is well sheltered from all, especially south-west winds, and a considerable number of vessels of any size may anchor in any part of it. The best berth is in 6 fathoms, north-westward of a rock in the bottom of the bay, where there is good protection from the sea of strong south-easters. The south-west side of this rock should not be closely approached.*

Supplies.—Provisions may be obtained by sending to Melada village.

ZAPPONTELLO PASSAGE between Melada and Isto is long and narrow, and encumbered by rocks; the depth in the most contracted part is about 3 fathoms.

If a small vessel should be obliged to take this passage, she should pass about 3 cables north-westward from Tramera rock, and steer for the north-west extreme of Melada, passing near Kamegnak and Kresak rocks, which are clean around. Mid-channel should be preserved between the two islands, as their shores are not of bold approach. The north-east entrance of this passage has no hidden danger.

MELADA and GROSSA PASSAGE.—This passage between the two islands is ordinarily taken by vessels bound to Zara, and, although very long, is preferable to Zappontello passage, and the best for vessels bound to Zara from southward. It is also called Sette Bocche.*

DIRECTIONS.—Golaz rock divides the south-west entrance of the passage, leaving a narrow channel with a depth of only 2 fathoms in some parts on the east side of it, and a channel on the west side, which may be taken by vessels of any size, and in which the only difficulty to be encountered with a fair wind is a rapid current. Bacili rocks, about $1\frac{1}{4}$ miles north-westward from Bianche point of Grossa island, must be avoided.

* See Plan of Sette Bocche and Port Berguglie, with View, No. 1,569; scale, $m = 1\cdot2$ inch.

When the passage has been opened, Golaz rock should be steered for, and left at a short distance on the starboard hand in order to keep clear of a bank of $5\frac{1}{2}$ fathoms, about 3 cables from Banastra point of Melada; and after passing between the two Ton rocks, a course should be steered so as to leave on the port hand the four small rocks which will be then seen.

The great Tramera rock will be recognized on approaching, by its double hill and bushy sides, and the position of the passage is indicated by Point Bianche light on Grossa island.

If bound to Berguglie bay, a vessel should, after following these directions for entering, give Banastra point a berth of 3 cables, in order to avoid the $5\frac{1}{2}$ fathoms bank above mentioned, and another of $4\frac{1}{2}$ fathoms at its eastern extreme.

SELVE ISLAND, having a low strip of land near its centre, has the appearance at a short distance seaward of two round islands of equal height, sloping gradually toward the shore. It is tolerably cultivated, and has a more fertile appearance than the neighbouring isles; it contains about 600 inhabitants, whose chief occupation is fishing and the care of cattle. The coasts are generally of little elevation, and, excepting the south-east and south-west sides, are of bold approach.

SELVE ROAD is in a bay formed by the west side of the low strip of land. It is a good anchorage in a bora gale for vessels of any size. The best berth is in 11 fathoms, sand and gravel, good holding-ground, at rather more than 2 cables from the shore, with Selve village bearing E. by N.

Supplies.—Water and provisions may be obtained at the village.

Pettini Rocks are three dark, barren, steep rocks, which divide into two, the channel between Selve, and Scarda and Premuda islands to the southward. Shoals of 4 feet extend about one mile north-westward from their north-west extreme.

ULBO ISLAND is, like Selve, divided near the middle by a low strip of land. A considerable portion is cultivated; cattle are bred on it. The coasts generally are not of bold approach, and the south-east, north-east, and north-west sides should not be closed within $1\frac{1}{2}$ mile.

ULBO ROAD is in a bay on the south-west side of the island, and is well protected from northerly and from westerly winds. The best berth is in 7 or 8 fathoms, sand and mud, at 3 cables from the shore, between the two points of the bay. Near the village, which is abreast of the anchorage, is a boat cove. Water may be obtained; provisions are scarce.

DIRECTIONS.—In proceeding to Ulbo road, and the passage between Selve and Ulbo from north-westward, a berth of at least $1\frac{1}{2}$ mile should

be given to Morovnich rock to avoid a rocky bank of 3 fathoms, and also to keep well clear of Selve, $1\frac{1}{2}$ mile from the north extreme of which is another rocky shoal of $5\frac{1}{2}$ fathoms. This passage is often taken by small vessels from Venice to Zara.

MAGRISINA ISLET lies $1\frac{1}{2}$ mile eastward from Ulbo; its north-east part is bare, the remainder is covered with bushes. Between it and Planicik rock, about 3 cables south-eastward from it, the depth is only 10 feet. Planicik is surrounded by shoals. Poclib rock, which lies one mile north-eastward from Magrisina, is clean around.

PAGO ISLAND, 32 miles long by 2 miles average width, is one of the largest of the Quarnero group, and mount St. Vito near the centre is 1,150 feet high. Only a small portion, which is sheltered from northerly winds, is cultivated; unlike Arbe, it is unprotected by high land north-eastward, and its climate is comparatively very severe in winter when it is frequently covered with snow, and northerly winds sweep over it with extreme violence. There are not more than 4,000 inhabitants, most of whom dwell in the town.

The chief products are salt, which is collected from numerous salt-ponds around a lake south-eastward of Pago road, honey, oil and wine, Sheep and goats are reared in considerable numbers. Only the north part of the island produces wood of any kind.

Opposite the main-land the coast is rocky, steep, and barren, with deep water at a short distance from it; it is constantly assailed by strong northerly winds, and excepting Port Pago, affords no shelter whatever.

PORT PAGO.—This port, which lies near the centre of the north-east coast, is a large triangular basin, capable of containing a number of vessels of any size: it is bordered south-westward by high precipitous land; the entrance, Bocca di Pago, is open to the south-east. The best anchorages for large vessels are in a small bay immediately beyond Rucizza, a point on the starboard hand, and farther to the westward, opposite St. Maddalena church, before arrival at some small rocks which will be seen just above water.

Vessels which visit Pago for salt, anchor on the port side after having passed St. Nicolò point, and secure to the shore near a small church; or, farther to the south-east, about one cable from Pago castle.

The south-west coast of Pago, although winding considerably, affords only indifferent anchorages for boats, excepting Ports Simone and Pogliana Nuova.

Supplies.—Water and provisions may be obtained at Pago castle.

DIRECTIONS.—The entrance to Pago is rather less than half-a-mile wide: its position is indicated by a chapel on St. Cristoforo point on the starboard hand. This point should not be closed, as a 2 fathoms bank runs off to nearly 4 cables from it. The three small rocks which will be seen on entering are steep-to.

PORT SIMONE, which lies north-eastward of Maon island is protected on all sides, and has a depth of $5\frac{1}{2}$ fathoms, muddy bottom; but its entrance being only about one cable wide cannot be taken without a fair wind. Mid-way between the two points forming the entrance should be preserved, as both are foul.

PORT PUGLIANA NUOVA.—This bay is near the south extreme of Pago, and at the north-west entrance of the channel of the same name: it is open to the north-west, but is well sheltered from all winds. It is customary to drop an anchor seaward, whence a considerable swell sometimes sets in, and to secure to the shore against the bora. The two points forming the entrance are shoal. A village on an eminence, about 3 cables from the shore on the port hand, marks the position of the bay.

Lagagn and Dolfin Rocks lie 2 miles westward from the north end of Pago: they are barren and uninhabited. The south-east extreme of the former is shoal. An awash rock lies about 3 cables northward from Dolfin: its south-east extreme is shoal. Small vessels occasionally anchor about 2 cables south-westward from Dolfin, for temporary refuge against a bora.

PAGO CHANNEL is formed by Arbe and Dolfin northward, and Pago and Lagagn to the southward, and is quite safe; it is used only by vessels bound to Arbe, or to Carlopago, on the Croatian coast.

SCARDIZZA ISLAND, which lies $1\frac{3}{4}$ mile south-westward from Pago, is a barren, bush-covered, rocky island of moderate elevation. The south-east extreme runs off shoal for more than 2 cables.

MAON ISLAND is one mile south-eastward from Scardizza, and is also, of moderate elevation, barren, and partly covered with bushes; its shores are of safe approach. Vessels may take shelter from a bora under the south-west coast, an extent of about 4 miles, in 7 or 8 fathoms, sandy bottom. Boats resort for refuge to various coves formed by this shore.

SCARDIZZA and MAON form, with Pago, a channel 7 miles long, with an average width of $1\frac{1}{2}$ mile. The south-east entrance is considerably contracted by two small rocks, from the easternmost of which a shoal of 3 to 13 feet extends about $4\frac{1}{2}$ cables towards Pago.

This channel, through which a rapid current flows, and which is frequently visited by violent bora gales, is seldom used; it is considered dangerous by the pilots.

PUNTADURA ISLAND is one mile south-westward from the eastern extreme of Pago, and may be recognized by two flat-topped hills; the western part is high; towards the east it is low and narrow. Numerous flocks of sheep find pasture, but excepting a plain near the middle of the island, in which is a village containing 200 inhabitants, it is uncultivated and overgrown with bushes. The neighbouring isles are low, barren, and of whitish aspect. The greater part of the shore of Puntadura is bordered by shoal water. Fresh water is not obtainable.

ANCHORAGE.—A depth of 9 and 10 fathoms, muddy bottom and good holding-ground extends about 3 miles along the south-west coast beyond Rastova, the westernmost point of the island. This locality is well protected by high lands from the bora. A large vessel should anchor in 9 to 14 fathoms, at rather more than 2 cables from the shore, Mount St. Giorgio, the highest part of the island, bearing E. by N.

PUNTADURA ROAD.—This is an excellent anchorage in a large bay formed by the southern shore of the island. It is well sheltered from all winds. Large vessels should anchor in about 6 fathoms, $3\frac{1}{2}$ cables south-westward from some houses on the beach, and at a short distance from the village. Small vessels anchor between the houses and Cosiach point, upon which are the ruins of a castle.

BREVILACQUA ANCHORAGE is south-eastward of Puntadura road, between the main-land and the island. It has a depth of 10 fathoms, mud. Artich point should be allowed a berth of more than one cable, and the bottom of the bay north-eastward, near Brevilacqua channel, should be avoided.

Midway between Puntadura and Melada islands there is a spacious sand-bank; the depth is 10 fathoms at its south-east, and 22 fathoms at its western, extreme.

Brevilacqua Channel.—This is a narrow passage with precipitous sides, between Puntadura and the mainland; the depth at low water is only one foot.

POGLIANA NUOVA CHANNEL.—This channel, also called Puntadura channel, which is formed by Puntadura and Pago islands, is the only practicable passage to Nona town. South-eastward, the depth in the middle is only four fathoms, and both shores, especially that of Pago, are shoal. The current always sets north-westward through this channel.

BORA BAY.—This bay is at the south-east extremity of Puntadura channel. The depth at the anchorage, abreast of St. Giacomo church, at 3 cables from the shore, is about 4 fathoms. The bora is very violent here.

Nona town—ancient *Enona*—is near the north-west extremity of Dalmatia, and at the mouth of Porto river. It is surrounded by the sea, and communicates by a causeway with the mainland. The bay, at the bottom of which it lies, is bordered by ponds and marshes, which render the air very unwholesome. It now contains but few inhabitants.

Water, &c.—There is an abundant supply of water; provisions are not procurable.

COASTS OF HUNGARY AND CROATIA.—Morlacca, or Montagna, channel embraces the whole of the coasts of Croatia and Hungary which are bordered by the Gulf of Quarnero.

The long chain of Velebich mountains which rises about a quarter of a mile from the sea, occasions violent bora squalls, which render the navigation dangerous, especially as the channel affords scarcely any tolerable anchorage. The coasting-vessels which use the channel on their way to Segna, Carlopago, and Novigradi keep close to the shore, so as to be within reach of the various coves and creeks formed by it, and never remain under way at night during the bad season.

MALTEMPO CHANNEL.—This is the portion of Morlacca channel between Porto Re and Segna town. It derives its name from the fury with which it is assailed by bora gales. It is very narrow between St. Marco and the mainland; the currents, are always rapid; the only places of shelter are some coves on the Hungarian shore.*

Between Porto Re and Segna the coast is barren and precipitous, without any shelter. Novi town, on the Hungarian frontier, is its only remarkable object.

Water may be procured at Novi.

PORT SEGNA.—This little port, on the mainland opposite to the easternmost part of Veglia, is formed by two moles, and is protected from southerly winds by the point upon which the town is built; it is exposed to north-westerly winds. Every precaution should be taken against the bora, which is severely felt here; the holding-ground is not good. Vessels sometimes prefer anchoring under Arbe island to exposure to bora gales in Segna. It often happens that while a heavy bora is blowing at Segna, a calm or a light breeze prevails 5 or 6 miles seaward.

* See Plan of Maltempo channel, No. 1,677; scale, m = 0.5 inch.

Segna town, which is close to the shore, is partly built upon a hilly point, which juts out to the westward, and is commanded by a large fort. It is one of the few much frequented commercial places of Croatia, and has 7,000 inhabitants. The port was declared free in 1785. It is hence that the building timber of the Croatian forest, and the corn and tobacco of Hungary, are exported.

Supplies.—Water and provisions, and materials for slight ship-repairs are procurable.

Bocca di Segna which has been already described, is the passage to Segna. Between Segna and Carlopago the coast is steep and rocky, and affords little shelter.

Lukovo Anchorage.—Small vessels may anchor for shelter abreast of Lukovo town at about one cable from the shore, to which it is customary to make fast.

Water may be obtained from a fountain close to the shore, about one mile northward from the anchorage.

PORT JABLANAZ, abreast of Jablanaz town, is a bay in which small vessels may take refuge, but the proximity of the superior anchorage in Barbato channel causes it to be seldom used.

Between Jablanaz and Carlopago, distant about 13 miles, the shore, which is bordered by Velebich mountains, is precipitous, and affords no places of shelter.

PORT CARLOPAGO.—This very small port is a bay, open to southerly winds. The anchorage is immediately inside the starboard point on entering, and, as the space is confined, it is customary to make fast to the shore. The passage between it and Pago is 2 miles broad, but heavy weather sometimes renders it impracticable for several successive days.

Carlopago town is on a tongue of land, which, extending in a southerly direction, forms one side of the bay. It is a small and poor town, containing 1,000 inhabitants.

Supplies.—Cistern water and provisions may be obtained at the town.

The COAST of Croatia, southward of Carlopago, affords no place of shelter whatever, excepting for small coasting-boats. Morlacca channel becomes contracted here and terminates south-eastward in Masliniza strait, which is formed by two high precipitous shores. The current caused by the waters of Zermagna river is often rapid.

The Zermagna is one of the chief rivers of Dalmatia: it rises among the mountains of Croatia, receives the waters of Kruppa river, and flows into Novigradi lake.

Rasanzi Rocks.—In the centre of Morlacca channel, and about 3 miles from Gliubaz strait are the three Rasanzi rocks awash, at the south-west extreme of which are shoals, which extend about half-a-mile from the longest of them.

MASLINIZA STRAIT.—This very narrow passage leads to Novigradi lake (Mare di Novigradi), a fine basin, surrounded by well-wooded hills. It has in the middle a depth of 18 fathoms which continues to within a few fathoms of the shores, which are about 50 to 100 feet high. It presents a picturesque appearance. Although the depth is ample, entrance is not easy to large vessels. In summer, the wind generally blows up the strait by day, and down by night.

Novigradi town lies at the head of the lake ; it is defended by a strong castle, but is of little importance, its port being suitable to boats only.

Karin lake is a basin bordered by high hills, which communicates with that of Novigradi by a narrow passage similar to Masliniza strait. It is visited by oyster boats only.

GLIUBAZ STRAIT, is a narrow winding passage between Pago island and the coast of Dalmatia. The land on each side is elevated and precipitous. The depth nearly throughout is 16 fathoms ; the current from Masliniza strait, accelerated by the waters of the Zermagna, sets strongly south-westward through it, and the bora blows with violence. This strait leads to several bays between Pago and the Dalmatian shore, including Nona, Gliubaz, and Artan ; these bays are visited by coasting-vessels only, which generally proceed thither by Puntadura channel.

CHAPTER VIII.

EASTERN COAST.—COAST OF DALMATIA, FROM NEAR LUKOVO TOWN
TO PORT ROGOSNIZZA, NEAR PLANCA POINT.Variation $12\frac{3}{4}^{\circ}$ to $2\frac{1}{4}^{\circ}$ West in 1861..

THE COAST of Dalmatia commences northward about 6 miles southward from Lukovo town, the confines of Croatia and Dalmatia on the sea-shore being marked by the church of St^a Maria Maddalena, which stands at the bottom of a small bay. It extends southward as far as Lastua castle, a straight distance of about 205 miles, and has numerous indentations, affording good anchorage, with many bordering islands and rocks. The depth of water near the shores is great. The bora often blows with great violence.*

Dalmatia is a mountainous country; it is traversed by the Dinaric Alps, of which the most remarkable chain is that of Montenegro, which stretches from the Alps to the Archipelago, and consists of steep and barren elevations, the ordinary height of which is about 3,000 feet. The heights bordering the shore at a short distance are generally bare and precipitous, with well cultivated bases seaward. In the interior are extensive forests of oak, fit for ship-building; those formerly near the shore have been exhausted.

The inhabitants are more addicted to lawless than to commercial or other legitimate pursuits, and never travel unarmed. Although this country embraces an extent of nearly 400 square miles, there is not a single collection of dwellings worthy of being called a village. Formerly, wine, oil, corn, figs, almonds, salt, wood, salt-fish, &c., were exported. Water is generally scarce.

THE DEPARTMENT of **ZARA** and **SERENICO** includes the coast between Brevilacqua strait and Planca point to the southward, an extent of about 60 miles, and various islands and rocks.

LUNGA, or GROSSA, ISLAND is 24 miles long, and its breadth varies from 2 miles to three-quarters of a mile.

* See Admiralty Chart: Adriatic Sea, Quarnero Gulf, from Promontore to Sloselle, No. 203; scale, $m = 0.2$ inch.

Its north-west extreme consists of low rocky land of whitish appearance; the height increases thence towards the south in a line of ash-coloured rocky elevations; the highest point, mount Vela Strasa, 1,100 feet, is near the middle of the island. There are about 1,600 inhabitants, the chief trade of whom is in salt-fish, firewood, and salt procured from lake Come. The only villages are on the north-east side of the island.

LIGHT.—Upon Bianche point, the north-west extreme of the island, is a *revolving* white light, which shows a bright face every 3 minutes; it is 130 feet above the sea, and may be seen in clear weather at the distance of 18 miles: the light-house is white and very conspicuous.

Bacili Rocks.—These, which have been previously mentioned, are two perfectly flat, and nearly awash rocks, surrounded by shoal water, and to which should be given a berth of half-a-mile; they lie about $1\frac{1}{4}$ mile W. by N. $\frac{3}{4}$ N. from the light.

PORT LUNGO, which is eastward of Bianche point, affords shelter to small craft, abreast of Soline village in 10 fathoms, sand.

In proceeding to this anchorage, whether passing northward or southward of Bacili rocks, a good berth should be given to the point under the lighthouse, north-westward of which is a shoal of 11 feet at a distance of about 2 cables. Having passed this point the village should be steered for, and the first of two small rocks, which will be seen on the starboard hand should be avoided.

The SOUTH-WEST COAST of the island is rocky and inaccessible. Mesagn rock, nearly 4 cables from the shore, and a small sand-bank of $6\frac{1}{2}$ fathoms, about three-quarters of a mile southward from this rock are the only outlying dangers.

Anchorage.—Vessels may anchor for protection from a bora gale along the south-west coast at a distance of from half a mile to 3 miles in about 36 fathoms, sand. The places ordinarily preferred are from abreast of mount Vela Strasa to about 3 miles from Mesagn rock, and between the latter and Bianche point. The anchor should be weighed as soon as the gale will permit.

Port Tajer, which is at the south extreme of Lunga, and surrounded by barren hills of moderate height, is one of the best ports in this quarter of the Adriatic. It consists of several basins communicating with each other, and has sufficient space for a considerable number of vessels in depths varying from 7 to 27 fathoms, generally sandy bottom.*

* See Plan of Port Tajer, No. 1,565; scale, $m = 1\cdot6$ inch.

The first of these basins is north-westward of two little rocks in the north-west part of it, in 19 fathoms. If a berth south-eastward of these rocks should be taken, the anchor should not be dropped in less than 27 fathoms mud, and the vessel should be moored with open hawse to the north-east.

Small craft frequently anchor on the north-east side of Catena island, near which is an awash shoal.

The second basin, the passage to which is about $2\frac{1}{2}$ cables broad, has a depth in the centre of 16 fathoms.

The third basin is larger than the second; vessels anchor in 11 fathoms southward of a rock which will be seen on entering.

The fourth, which is the best of the basins, has a depth of 7 fathoms, and is perfectly sheltered. Vessels may here safely heave down for repair; north-westward of two bare rocks in the west part of this basin the depth is from $2\frac{3}{4}$ to 5 fathoms.

Neither water nor provisions are procurable at Tajer.

DIRECTIONS.—Port Tajer is not of difficult access, although numerous islands are in the way; all of these are clean around. Four rocks lie at the entrance, the Due Sorelle (two sisters), and the two Germinach rocks; the largest of the Sorelle, and the largest of the Germinachs, are the nearest to Belvedere point of all the rocks in this vicinity, except Tajer rock which is close to it, and has a very low, flat, trencher-like appearance, whence its name. The Due Sorelle should be left on the starboard hand, and a course north-eastward then steered to pass on the left side of Obravacina; thence, steering to the northward and passing between Abatuta rock and Belvedere point, the narrow entrance to the port will be opened.

Passage between Catena and Incoronata islands. Abatuta rock and Catena island, which are left on the starboard hand when entering Tajer, contract greatly this passage, which, moreover, is tortuous. It is sometimes taken by vessels on their way to Mezzo channel, which, after steering as if bound to Tajer, pass between Abatuta and Catena. But this narrow pass is difficult, and the difficulty is increased by the current which often sets strongly to the south-west.

The North-east COAST of Lunga has many bays; but the only anchorage suitable to vessels of large draught is that of Terstenich, midway between Lunga, and Kerknata islet, in 10 or 11 fathoms sand. Zaglava village, situated on an eminence opposite Kerknata, marks this spot.

PORT DOMBOCH at the eastern extremity of the channel between Lunga and Sverinaz islands, is entirely protected northward by Magasich

rock, either side of which may be passed on proceeding to this anchorage. The depth is 9 fathoms, mud.

Small coasters anchor in a cove on the eastern side.

LUKA BAY, opposite mount Vela Strasa, is occasionally visited by vessels of large draught, but Rava island renders access to it difficult: the depth is 12 fathoms, mud, and generally one anchor is dropped midway between the village and Gubaz point, and another north-eastward.

There are no supplies here.

In proceeding to Luka from northward, Rava island, which is well cultivated, and has a village and church on its central and highest part, may be safely passed on either side. When approaching from southward, the south-east extreme of Rava should be avoided, and the passage taken north-westward of Grande rock off Gubaz point, between Grande and the south-east point of Rava, leaving Maslinovaz rock on the starboard hand.

Awash rocks between Gubaz point and Grande, bar the entrance on the north-east side.

Coasters anchor south-westward of Rava, and under various other rocks on the north-east of Lunga: also off Sale village opposite Labdara island which is south-eastward of Kerknata.

INCORONATA ISLAND, and neighbourhood. This island immediately south-eastward of Lunga, of which it may be said to form a continuation, is very narrow, especially at its southern extreme, and at a distance exhibits a range of whitish conical hillocks resembling the points of a diadem; whence its name. These elevations are greater than those of Curvabella islet and of the numerous rocks bordering its whole south-west side. The highest point, mount Opat, 715 feet, is near the south extreme. Both Lunga and Curvabella and the surrounding rocks are sterile and uninhabited.

ANCHORAGE.—On the west side of the island, northward of the narrow portion, there are numerous anchorages for coasting-vessels, but the navigation of these localities is very difficult for strangers, especially as the current sets rapidly through the passages. All the dangers here are, however, a little elevated above water, excepting between the two Rassip rocks, where there is a shoal of two feet.

At the distance of one cable outside the line of rocks there is a considerable depth.

The group of rocks southward, abreast of the narrow part of Incoronata are of less safe approach, and there is no anchorage whatever near them.

CURVABELLA ISLET.—This is a small narrow island south-eastward of Incoronata: it consists of rounded hillocks which are rather lower than the neighbouring rocks. The highest part of it is 377 feet above the sea.

The passage northward of this islet, between it and Incoronata, is sometimes taken by vessels on the way to Mezzo channel, which steer between Incoronata and Scuglie rock on the one hand, and Smoquizza and Curvabella on the other. Approaching from southward, the large Ochiuch rock, which is of horse-shoe form, and south-westward of Curvabella, should be steered for, and with Smoquizza, and the latter, be left on the starboard hand.

This passage, which is very narrow, should not be attempted without a good leading wind, as the current through it is always strong.

The passage southward of Curvabella, between it and Zuri island, is encumbered by a number of steep-sided rocks, the depth around which is considerable, and two shoals. Approaching from southward, Lucietta, which is the south-westernmost of the group, will be seen: it should be passed at a short distance, and a course steered to leave to port, Sedlo rock which lies 2 miles north from it. By passing eastward of Sedlo, Lucietta bank which has a depth of 11 feet, and Piatti bank, which is nearly awash, will be avoided: when abreast of this rock a N. by W. course may be steered, if bound to Zara, in order to pass on the starboard hand of Martognack, is a high round rock about 2 cables wide.

Vessels from eastward or south-eastward may pass between Zuri and the group of five rocks which bear about W.S.W. from mount Bol, the highest elevation of Zuri; also between this group and Lucietta, which are more than one mile apart. All these rocks are steep to on the south-west side. Two shoals lie south-eastward of them, and they should not therefore be approached on this quarter within 2 miles.

Between Incoronata and Zut islands the passage is about $6\frac{1}{2}$ cables wide; the south-east entrance is much obstructed by rocks and by a shoal of two feet; the latter is about one cable south-eastward from Dannizze rock.

The whole north-east coast of Incoronata consists of inaccessible cliffs: the opposite coast of Zut is also steep, and close to it is a depth of 12 fathoms. The depth in the middle of the passage is 38 fathoms, mud, and there is scarcely anchoring-ground along the shore of Zut for the smallest vessel. If a vessel from eastward should be obliged to take this passage she should at once close one of the two islands, and pass on the port, or on the starboard hand, *all* the rocks and shoals near the middle of entrance.

MEZZO CHANNEL.—This channel which is a continuation of that of Quarnerolo, with which it communicates by various narrow passages contains many islets, rocks and shoals, and is little frequented, preference being given in fine weather to the passage outside the island, and, under other circumstances, to Zara channel.

For vessels approaching by Sette Bocche channel, there are three safe passages to Mezzo channel; the first between Melada island and Sverinaz, the second between the latter and the large Ton rock, and the third between Ton and Sestrugn island; all of which have sufficient depth for vessels of the greatest draught. The south extremes of Ton and Sverinaz should not be closely approached.

There are safe passages from Mezzo channel to that of Quarnerolo, formed by Ugliano, Rivagn and Sestrugn islands. The narrowest of these, between Ugliano and Rivagn, has a depth in the middle of 3 fathoms. The current through it is rapid.

The passage between Rivagn and Sestrugn is divided into two by Tre Sorelle rocks (three sisters). Vessels may pass between these rocks, or between them and the islands. A shoal of 2 feet lies nearly 3 cables north-westward from the northernmost of the Sorelle.

ANCHORAGE.—Shelter may be obtained from a bora gale at about $1\frac{1}{2}$ cable south-westward from the centre one of these three rocks, in 9 fathoms, sand; but this spot is exposed to south-easterly and north-westerly winds, and the current is strongly felt.

SESTRUGN is the most elevated of the islands in the neighbourhood, and is covered with bushes, excepting the cultivated space around the village. There are two small rocks off its south-east extreme, and the north-west point should be avoided.

ESO ISLAND separates Mezzo channel into two. Its highest part is the north-west side, whence the slope is gradual. Nearly the whole of the north-east portion is cultivated; the opposite side is covered with bushes. There are about 300 inhabitants who manufacture earthenware for exportation.

ANCHORAGE.—Between Eso and Bilo rock north-westward, vessels of considerable draught take shelter, in 11 fathoms, sandy bottom. In proceeding to this anchorage there are two shoals to be avoided; one lies $5\frac{1}{2}$ cables north-eastward, and the other about 7 cables north-westward, from Bilo.

Between Ugliano and Eso there are no hidden dangers. Between the latter and Rava island there are two small rocks, Cudizza and Fulia, which should not be closely approached; the latter is at about the centre of the coast of Eso, and Cudizza three-quarters of a mile south-eastward from it; both are near the shore.

Between Incoronata and Pasman islands, the middle of Mezzo channel is rendered impracticable, excepting to boats, by islands and rocks. Zut and Zit islands are the most important of these; they are of very sterile aspect, but afford pasturage to numerous flocks of sheep.

Directions have been already given for vessels which, proceeding from south-eastward, are obliged to pass between Zut and Incoronata: the passage between Zut and Zit should not be attempted. The best passage is decidedly between the latter and Pasman, the western coast of which is steep-to, and without any dangers.

UGLIANO ISLAND.—This island, whose eastern shore forms, with the mainland, Zara channel, is $1\frac{1}{2}$ mile only from the latter. It is composed of a number of hillocks of moderate elevation; the most remarkable of these are Mount Schah, the highest, and near the middle of the island; and another south-westward, upon which is old St. Michele castle. There are 2,500 inhabitants, who principally reside on the north-east side. Wine and oil are the products, and fishing is the chief occupation. Like most of the Illyrian islands, Ugliano affords little fresh water.

The South-west **COAST** rises abruptly, is steep-to, is covered with wood, and uninhabited. The only anchorage which it affords is Lamiane bay at its south extreme; Lamiane is resorted to by small craft; access to it is rendered difficult by rocks at the entrance.

The East **COAST** which slopes gradually to the sea, is of bold approach. The only anchorage is Port Cale, south-westward of Calugerà or Lazzaretto rock, between it and the island: the rock is overgrown with bushes, and on the north-west side of it are a house, some mills and a patch of cultivated ground. The depth is 15 fathoms, sand.

The Venetian vessels-of-war which were too large for Port Zara, used to resort to this anchorage to perform repairs, and for the winter season. Cale town is small; northward of it is a fishing-boat cove. Cistern water may be obtained in small quantity.

PORT SDRELAZ is a little harbour formed by the narrow space between Pasman and Ugliano, and has a depth of little more than 2 fathoms, mud. The north-east passage is alone practicable by vessels, and has a depth of about $3\frac{1}{2}$ fathoms.

PASMAN ISLAND.—This island is rather more hilly than Ugliano, of which it may be considered a continuation, with the interruption of the narrow Sdrelaz strait; it has 3,000 inhabitants, the greater part of whom reside in five villages on the north-east side; their occupations and the produce of the soil are similar to those of Ugliano.

PORTS LANGIN and SOLINE—the former near Cossara rock, off the south-west extreme, and the latter a short distance northward—are frequented by small craft, which lay a cable out to the shore north-eastward;

in both, the depth is about 12 fathoms. Bora squalls are severely felt in them.

PORT TRILUKA at the south-east extreme, is convenient for small vessels prevented by the current or contrary winds from proceeding through Pasman strait; it has a depth of 10 to 15 fathoms, muddy bottom, and is well protected from the bora and westerly winds by the island, and on the southern quarter by Gangaro and Tre Kotole rocks. The passage to this anchorage is between the two small Kamicich rocks, or between the north-easternmost, and the south-east extreme of the island. There is a rocky shoal of about 3 feet near the north-east point of Sisagn rock.

PASMAN STRAIT, which is a continuation of Zara channel, is rendered difficult by its narrowness, numerous rocks and shoals, and irregular currents. Both sides are well cultivated and produce oil and Muscadel wine.*

There are two passages through the strait; the western, westward of Babaz and Comornica islands, is the most frequented, and alone practicable by large vessels. In the centre of its narrowest part the depth is 4 fathoms.

Proceeding through this western passage from northward, a vessel in order to keep in at least 4 fathoms after passing the narrowest part between Babaz and Pasman village, should haul to port and steer between the former and Termich rocks; then between Termich rocks and a small rocky bank of $1\frac{1}{2}$ fathom, about N.E. by E. of them.

In taking the eastern passage the small $1\frac{1}{2}$ fathom bank above mentioned should be carefully avoided, as the soundings do not indicate approach to it.

The bottom in it is, almost everywhere, sand and shell, and the water being very clear the depth often appears less than it is, owing to change of colour. When the current is opposed by a strong wind an increase of depth takes place, especially at the narrowest parts.

When proceeding to the strait from southward, one of the passages between Vergada island and rocks, and Pasman may be taken. Vergada Ghiza, and Sibnata should be left on the starboard hand, and the three Kotole rocks on the other; either side of Kamicich rock may be taken. About 2 miles south-eastward of Zara Vecchia, close to the shore, on the right of the entrance to the strait, is Osteria rock, off which is shoal water.

There is also a passage between Vergada and Jarta Grande, a steep rock covered with bushes, on the north-west of which is Jarta Piccola, with a shoal extending northward. In taking this passage the big Morvegnach

* See Plan of Pasman Strait, No. 1,570; scale, $m = 1.9$ inch.

rock should be left on the port hand, and the western point of Morter island, off which is an awash rocky bank, should not be approached within half-a-mile. The small Vissavaz rock, which lies in the middle of the passage, should be left on the starboard hand.

If a vessel should wish to pass southward of Morvegnach, she should shape a course westward of all the rocks southward of Vergada, and then pass between Sibnata and Obun rocks.

ANCHORAGE.—Large vessels come to, north-westward of Zara Vecchia town in $5\frac{1}{2}$ fathoms, or in the middle of the strait, southward of Clanaz, and St. Caterina islets; also southward of Babaz, between it and Muntan islet, but this is not a good berth, excepting in very fine weather. Cistern-water in small quantity, the only resource is, obtainable at Zara Vecchia, an unimportant, but the chief town or village in the strait.

VERGADA ISLAND, which is $2\frac{1}{4}$ miles south-eastward from Pasman is formed by arid hillocks of nearly equal height; its most elevated point is 530 feet above the sea. There is no good anchorage around it; a village is on the north-east side.

The COAST of the mainland between Zara Vecchia and Jarta Grande should not be approached within $5\frac{1}{2}$ fathoms, which depth will be found at little more than $1\frac{1}{2}$ cable from it; and at this distance a vessel may anchor, if detained by weather.

TONARA BAY, on the north side of the point of this name, is open to the westward, but is sheltered on this quarter by Zovinzi rocks; the depth in the middle is $5\frac{1}{2}$ fathoms, sand. Mount Dubiuka overlooks and marks this anchorage, in proceeding to which a vessel should pass between Zovinzi rocks and the south point of the bay; the passage northward of them being unsafe.

Lake Vrana, which is inland of mount Dubiuka, renders the air in the vicinity unwholesome.

SLOSELLE BAY is a deep indentation of the main coast, opposite Morter island. The passages to it between the mainland and Jarta Grande, and between the latter and Morter, are so obstructed by rocks and shoals that only very small vessels visit it.

Supplies.—Water in abundance, and provisions, may be procured at Sloselle town; fish is plentiful in the bay.

ZARA CHANNEL.—The depth in this channel between Ugliano and Pasman, and the coast of Dalmatia, varies from 27 fathoms, mud and sand, southward, to about 9 fathoms. There are no hidden dangers.*

* See Admiralty Chart: Dalmatian Islands, from Sloselle to Ragusa Vecchia, No. 204; scale, m. = 0.2 inch.

The main coast from Artich point, to 4 miles south-eastward from Zara town, is bordered by low hillocks, and well cultivated ground; southward, as far as the neighbourhood of Zara Vecchia town, the land is higher and of desolate aspect.

ANCHORAGE.—Diclo anchorage, about 8 miles from Artich point has a depth of 11 fathoms, mud, midway between Diclo town and Amica point. About 8 miles northward of this, is Peterzani town, close to the sea and commanded by a high hill in the rear of it.

PORT ZARA, a secure harbour, little more than one cable wide, is one mile south-eastward from Diclo, and inside a peninsula point, which runs out parallel with the coast, and upon which Zara town is built. The soundings are about 7 fathoms near the entrance, whence they decrease to a few feet abreast of the south-east bastion; the bottom on the north-east side is rocky. Vessels moor across with a cable to each shore; the small craft which go inside, anchor off the entrance, which is reduced by the Porporella, a stone rampart under water, to a breadth of 14 fathoms, and warp up to a berth.*

Zara town—ancient Jadera—is the residence of the Governor of Dalmatia; it is surrounded by fortifications, and cut off from the mainland by a ditch. It was the bulwark of the Venetian republic, and was very populous; it now contains 9,000 inhabitants who carry on considerable commerce in wine, oil, and grain. An arsenal, store-houses, hospitals, barracks, the ruins of an aqueduct, an opera house, and a fine cathedral attest its former importance; the marine gate is part of an ancient funeral arch. The neighbouring town of Nona has furnished it with many relics of antiquity.

Supplies.—Water may be procured from a spring half-a-mile southward from the town, near an old lazaretto close to the shore; rain-water only can be obtained in the town. Provisions are plentiful. Maraschino, made from the marasca or wild cherry, is the chief export.

ANCHORAGE.—Vessels too large to enter the port anchor north-westward of the town, or in the bay between it and Amica point, southward of a rocky ledge, which juts out from the shore nearly midway from the town to Amica; the depth here is 8 to 10 fathoms. There is good anchorage about half-a-mile from any part of the shore of Zara in 19 or 20 fathoms.

There are none but indifferent anchorages on the Dalmatian coast between the one last mentioned and Pasman strait. Small vessels, however, bring up between Zara and Bibigne, in 9 or 10 fathoms, muddy bottom, at about 2 cables from the shore; also in $5\frac{1}{2}$ fathoms at Port St. Cassano on

* See Plan of Zara, the capital of Dalmatia, No. 1,560; scale, $m = 5\cdot2$ inches.

entering which, it is necessary to avoid the starboard point, and to drop the anchor near the middle, whence the soundings decrease rapidly, becoming rocky near the shore. Small vessels also anchor abreast of Pecina village, in $5\frac{1}{2}$ fathoms, at about 2 cables from the shore, and off Karcina village, at the entrance to Pasman strait.

MORTER ISLAND and CHANNEL.—This low island is connected with the mainland by a swinging-bridge. It is exceedingly well cultivated, and has 2,000 inhabitants, who reside on the northern and eastern sides, and whose chief occupation is the culture of the vine, the fig, and the olive. It appears to have been an ancient cemetery. The view from the island is very beautiful.*

The **South-west COAST**, which is uninhabited, has deep water close to it, and affords no places of shelter even for very small vessels, excepting Port St. Nicolò, in which they bring up when not intending to enter the channel at night. The high point at the left of the entrance, which is sugar-loaf shaped, marks this anchorage.

Water may be procured from cisterns and a few wells at the villages.

The Cocogliari are three small rocks about half-a-mile southward of St. Nicolò; they are of bold approach excepting the west side of the westernmost, off which is an awash rocky bank.

ANCHORAGE.—Vessels anchor in the south part of the channel between Morter and the main in $6\frac{1}{2}$ fathoms, between Stretto town and Lutaz rock, and in the small bay abreast of the town. Those drawing less than 16 feet find shelter in Port Gesserà, a cove near Gesserà village, off which is Tisno rock. The north-west part of the channel is visited by vessels of very light draught.

In approaching the south-east part of the channel, which contains numerous rocks, the clock-tower of Gesserà is visible at a considerable distance. The vicinity of Botticella, a small half-tide rock, shaped like a boat, should be avoided; it lies about 1 mile S. $\frac{3}{4}$ E. from Obenus point on the main coast.

ZURI ISLAND.—This is the southernmost of the group of islands near, north-westward of, Planca point: it is formed by two parallel lines of hills, the most remarkable of which is Mount Bol, which is crowned by a tower. At a distance, the island appears divided into two parts, of which the north-western is the higher. The plain between is well cultivated. Zuri village is at the foot, north-eastward, of the mount.

* See Plan of Morter Channel and Strait, No. 1,567; scale, $m = 1\cdot9$ inch.

On approaching from southward, the coast south-eastward appears covered with trees and bushes ; north-westward it is generally rocky and of whitish aspect.

There are coral fisheries in the neighbourhood ; sardines, and other fish, are caught in great abundance.

PORT SARACINO lies south-eastward of the north-west extreme, and abreast of the lowest part of the island. It is a small port, well sheltered from all but southerly winds ; the anchorage is in 12 fathoms, at about the centre of its length, and abreast of a cove to starboard on entering.

A group of rocks south-westward, and Mount Bol, which is close to it, point out this little port, in approaching which a shoal of 7 feet, about half-a-mile E.S.E. from Camignac rock must be avoided.

STUPIZZA BAY, $1\frac{1}{2}$ mile from the south-east extreme of the island, is well protected from northerly and westerly, but much exposed to south-easterly winds. The anchorage for vessels of considerable size is at the entrance, in 9 to 11 fathoms ; north-westward, the depth is 7 fathoms and the bottom rocky.

Water may be obtained at an old castle.

The passage to Stupizza is between Scroada and Bacolo rocks, off the two points of it. There is shoal water off the former ; also a shoal extending more than $1\frac{1}{2}$ cable from the point on the port side of the entrance. The position of the bay is indicated by the old castle, which is on a high, whitish hill.

The north-east coast, southward of Port Zuri, is quite exposed to the bora, from which it affords no shelter for the smallest vessel.

PORT ZURI.—Vessels of moderate size anchor off the village in 14 to 17 fathoms sand, and weed, and secure to the shore ; it is open to the north-west. There is a mole, inside of which boats take refuge. Bracie bank, on which is a depth of 9 feet, is about three-quarters of a mile north-westward from the entrance to Zuri, and affords some protection from the swell on the quarter to which it is open. Port Zuri may be recognized by some large store-houses on the sea-side.

A rocky shoal of 3 fathoms lies about $1\frac{1}{2}$ cable north-eastward from the north-west extreme of the island.

KAKAN ISLAND, which is between Capri and Zuri islands, is composed of barren hillocks, with intervals covered with bushes, and is generally of less elevation than the latter.

The south-west coast affords no shelter whatever.

BRUGNAC BAY.—This little anchorage, at about the centre of the north-east coast, is protected by the rocks of this name, close to Ostrizza.

point. The best berth is in 9 fathoms south-westward of the south-easternmost of the rocks. The passage to it is between the island and the easternmost rock.

The passage between Zuri and Kakan is sometimes taken by vessels bound to Zuri. Mid-channel should be preserved in order to avoid a shoal of 13 feet, which lies about $6\frac{1}{2}$ cables north-westward from Grossa point. A vessel should not attempt to pass between the rocks south-eastward of Tetevisgnach and Kakan, but there is a narrow channel between them and Ciablin rock, and also between the latter and a 4 feet shoal, at $6\frac{1}{4}$ cables from it. In the first of these the depth is 25 fathoms, and in the other 17 fathoms.

CAPRI ISLAND is, like Kakan, composed of barren hills, the highest of which is south-eastward. The narrow channel between it and Kakan is seldom used, even by the native coasters; the current through it is rapid.

Port Capri on the south-west side is the only anchorage; near it is a small village: the depth is about 8 fathoms at the entrance, whence the decrease is gradual. It is well sheltered, and affords good refuge to small vessels.

SMAJAN ISLAND, when seen from southward, has the appearance of a long hill, of which the highest part (460 feet) is north-westward. Its sides, which are steep-to, afford no shelter. It forms, with Capri, a narrow channel, which is rendered almost impassable by rocks and shoals, among which the current sets with considerable velocity.

Six rocks form a continuation for about 4 miles of the south-east extreme of Smajan; they run parallel with Zlarina island, with which they form a channel, to be subsequently described. All these rocks are of safe approach, excepting Comorisco, the southernmost of them, close to which is an awash rock.

BICE ISLAND, 1 mile north-eastward from Smajan, is formed by several conical hills covered with wood. The shores are of bold approach. The channel between Bice and Smajan, which has a depth of 22 to 33 fathoms, is quite safe.

ZLARINA ISLAND.—This island, two miles eastward from Smajan, appears, when seen from north-eastward, to be covered with vines and olive-trees; when seen from the opposite quarter it presents a very barren aspect. Excepting at its northern extreme, the shores are safe to within a very short distance.

The south-west coast forms a triangular bay, which has a depth of $5\frac{1}{2}$ and $6\frac{1}{2}$ fathoms, mud, sand, and gravel. Boats find shelter in a cove

near the village at the bottom of the bay. The village church is plainly visible at a considerable distance seaward.

Supplies.—Water and provisions may be obtained at the village; the water, which is rather brackish, from a spring near the shore.

Bice and Zlarina islands form with Smajan, and its six rocks above mentioned, the channel most frequented by vessels bound to Zara from the neighbourhood of Planca point. This channel is to windward of, and safer than, those already described.

Approaching it from southward or from eastward, Comorisco, the south-easternmost rock, will be recognized, and the passage should be taken between it and Zlarina; the latter should then be neared to avoid a shoal of 13 feet, about $6\frac{1}{2}$ cables N.E. by E. from Sestra grande rock. The vessel should not be kept a greater distance than three-quarters of a mile from the shore of Zlarina, and should not haul to port for the passage between Smajan and Bice islands till the north-west extreme of Zlarina bears N.E. by E.

PROVICCHIO ISLAND, eastward of Bice, is generally lower than those surrounding it, and is of more agreeable aspect, being covered with vines and fruit trees. There are about 1,200 inhabitants, many of whom are fishermen; great quantities of salt-fish are exported. There are many country-houses belonging to the inhabitants of Sebenico.

The shores are without hidden dangers, excepting the north extreme, which is rather shoal. In taking the passage between this island and the main, the shore of the latter must not be closely approached.

ANCHORAGE.—Small craft anchor off Seporina village, on the south-west side of the island, in about 7 fathoms, hard mud; there is a fishing-boat cove close to the village.

Provicchio village is on the south-east side, at the bottom of a bay which affords shelter to boats only.

This island forms with Bice a safe passage to Vodizze road.

VODIZZE ROAD, in the north-east part of Sebenico channel, is one of the best anchorages on the Dalmatian coast, and is much frequented, especially by vessels awaiting favourable weather to proceed through the narrow channel to Port Sebenico.*

The anchorage is about mid-way between the village and the north-west point of Provicchio. Vessels of light draught anchor near the village eastward of the projecting point westward of it, preserving a

* See Plan of Port Sebenico, with the outer channels and Vodizze Road, No. 1,581; scale, $m = 1\cdot5$ inch.

distance of at least 2 cables from the shore, near which the bottom is rocky.

Vodizze village is of considerable size and well built. About a mile from it is the small village Tribouhug, the birthplace of the celebrated extempore lyric poet Papizza, and where, as at Vodizze, grows the cherry from which produces the maraschino of Zara and Sebenico.

Supplies.—Here is a spring, from the abundance of whose waters Vodizze derives its name: provisions are procurable; vessels frequently arrive from Sebenico for supplies of both.

The passage to Vodizze road is, when approaching from eastward, or from southward, between Bice and Provicchio; when from westward, it is between Bice and Logoron avoiding the south extreme of the latter, or, by Sebenico channel, between Provicchio and the main.

The COAST between Vodizze and Trebocconi town, $1\frac{1}{2}$ mile westward, has a depth of only $3\frac{1}{2}$ fathoms at the distance of $1\frac{1}{2}$ cable from it. Trebocconi town, which stands on a rock, is connected by a swinging bridge with a peninsular point of the main land; upon the peninsula is St. Nicolò church, which is a good mark for this part of the coast.

SEBENICO CHANNEL.—Vessels prevented from proceeding in this channel, which is much contracted in some parts by shoal water, may anchor anywhere in the middle of it, in convenient depth and good holding-ground, or between Zlarina and the mainland, close under the latter—if apprehensive of a bora gale.*

The channel becomes wider between the south-east extreme of Zlarina and the main, but the entrance here is obstructed by rocks, among which are but narrow passages. Crapano, the most remarkable of the rocks in the neighbourhood, is well cultivated, and inhabited by about 100 persons, whose chief occupation is catching tunny fish. Eastward of it is a narrow passage, with cliffy sides, to Andreis town and castle, and Morigne lake.

PORT SEBENICO is a narrow basin surrounded by high land and bordered by a rocky shore; the depth in it varies from 13 to 23 fathoms, soft mud. The bora is severely felt, but the port is a good, commodious anchorage.

Sebenico town is in the form of an amphitheatre, and picturesquely situated close to the water, at the base of the barren Tartari hills. It was formerly considered the strongest city of Dalmatia, and in 1807 was unsuccessfully besieged by 40,000 Turks; but the town and fortifications

* See Plan of Port Sebenico, with the outer channels and Vodizze Road, No. 1,581; scale, $m = 1\cdot5$ inch.

are now almost in ruins : the cathedral is reckoned the oldest and finest in Dalmatia. It has about 9,000 inhabitants, who cultivate the vine and the olive on a not very fruitful soil, and export horses and cattle to Naples, from Bosnia. There is a road leading to Zuri, Spalatro, and the interior of Dalmatia.

Water.—The water is good and plentiful : this is the only supply.

The best berth is off the town, northward, or southward, of a coral bank of 8 fathoms, the inner part of which is not far from the Health-office. Another coral bank lies at the entrance of the small Propat bay, about half-a-mile south-eastward from the town.

St. Pietro bay, at the south-east extreme of the basin, affords good shelter in $6\frac{1}{2}$ fathoms, muddy bottom.

Kerka river, which empties itself at the north-west part of the basin has its source at the base of the Dinara mountains, and after receiving several mountain torrents forms just before arriving at Scardona a celebrated waterfall. It is navigable by small vessels as far up as Scardona village, once a large handsome town, and between which and Bosnia there is still considerable commerce. Lake Scardona produces the *skilli*, a fish highly esteemed.

DIRECTIONS.—The narrow St. Antonio channel to Port Sebenico is between rocky cliffs ; the breadth at the outer entrance, between some low rocks, nearly level with the water, is about one cable. This entrance is defended by St. Nicolò, a strong fort on one of the above rocks, with a line of embrasures at the edge of the water. The north side of Thurm point, at the left of the inner entrance, must not be closed, being bordered by shoal water.

There are three passages to Sebenico channel, the northern, the western, and the southern.

The northern passage, between the main and Provicchio, has been already mentioned in connexion with the latter. In proceeding by this, or by the western passage to Sebenico, care must be taken not to stand for the entrance of St. Antonio channel until south-eastward of the line joining St. Nicolò fort, with the north-west extreme of Zlarina, in order to avoid the shoal off St. Antonio.

The western passage, between Provicchio and Zlarina, is less than $4\frac{1}{2}$ cables broad ; it is between Lupaz islet and an awash rock, between which, and the north-west extreme of Zlarina, is a 10 feet shoal. It is little frequented owing to its intricacy.

The southern passage, between Zlarina, and Cunaz and Oblich rocks, is the best and the most frequented ; it is very narrow, but short, and may be taken in a strong south-east wind, which would be favourable for running through St. Antonio channel ; and in bad weather from this quarter,

which is here so common, a vessel may come to between Zlarina and the main, or bear up for Vodizze road.

The position of Sebenico port and channel may be recognized by an interruption in the line of islands and rocks which almost continuously border the Dalmatian shore; also by Zuri, the outermost of the group off it, and, at a near approach, by Capo Cesto village church, which is visible at a considerable distance.

PORT SEBENICO VECCHIO is formed by a long hilly peninsula southward of Sebenico channel, and the mainland, and consists of a narrow bay or inlet, which has a depth of 25 fathoms at the entrance, and 12 fathoms at about $1\frac{1}{2}$ mile inside. Vessels of considerable size anchor at the latter locality. North-westerly winds raise a heavy sea near the entrance. This port is not often visited owing to the vicinity of Port Sebenico, which is preferred to it. Grebascizza town is at the bottom of the bay.

Water may be procured from a spring near the ruins of a house eastward.

Sebenico Vecchio may be recognized by a long ancient wall on the heights; in proceeding to it a vessel may pass on either side of Plana rock, which lies at the south point of the bay. A rocky bank of $3\frac{1}{2}$ fathoms, lies south-westward of the south-west point of Plana, and the south point of the bay is shoal.

The most populous and remarkable islands in the district of Sebenico are, Parvicchio, Zlarina, and Zuri. In these, very good wine is produced, and fishing is carried on with great profit to the inhabitants. Parvicchio is beautifully fertile. Zuri is well known by its numerous Roman ruins, and the extensive coral fishery which was formerly carried on by the Neapolitans. Between Zuri and the main lie several islets containing good marble quarries. The coast, between Sebenico Vecchio, and Capo Cesto, 6 miles from Planca point, is bordered by rocky mountains.

PORT CAPO CESTO is between the point upon which Capo Cesto village stands, and the sugar-loaf shaped peninsula, point Cremica, to the southward. The depth in the centre is 12 to 16 fathoms, and it is customary to lay out a cable north-eastward to the shore against westerly and bora winds, to which this berth is exposed. It is a good, although small, port.

PORT CAPO CESTO ROCKS.—Between Capo Cesto and Planca point are several rocks and shoals known by this name. The largest of them, Maslinovich, is about 3 miles westward from the village, and half-a-mile westward from Cremica point. Vessels bound to Capo Cesto from southward usually pass between this rock and Cremica point. A rocky shoal of $2\frac{1}{2}$ fathoms, which lies in the middle of this passage, will be avoided by

keeping close either to the east side of the rock, or to the main coast near the mouth of Port Peles. Gerbovaz rock also has a shoal of one fathom, extending to nearly 3 cables south-south-eastward from it. Aid bank is a rocky shoal of 6 fathoms, $1\frac{1}{2}$ mile south-westward from Gerbovaz.

The passage between these rocks is safe, but it would be prudent, when bound to Capo Cesto from westward, to leave them all on the starboard hand, and when approaching from southward or from eastward to close the main land after passing Mulo rock, so as to pass near Zecevo point.

PORT PELES.—This little bay, close to the southward of Cremica point, has a depth, in the middle of the north branch of it, of 7 fathoms, muddy bottom, where small craft may moor in safety. The southern branch, which is still more contracted and less secure, is fit for boats only, which should moor behind one of the points projecting from the south shore, to shelter themselves from the sea sent in by westerly winds.

PORT ROGOSNIZZA.—This is a nearly circular spacious bay close to the northward of Planca point, and surrounded by barren hillocks of little elevation. It is divided into two parts by Rogosnizza islet, on the north side of which is the village.*

Large vessels anchor before the village in 18 fathoms, or abreast of Rogosnizza islet in 14 to 22 fathoms, sand and shell, or north-eastward of the village in from 9 to 12 fathoms. The latter anchorage is well protected, and vessels may safely heave down in it for repairs. Small craft moor westward of the rock and secure to the shore near some houses southward of the village. Rogosnizza is safe in all winds, and the entrance is easy.

Water may be procured at a spot on the mainland north-westward. The inhabitants are extremely poor; a few goats, Indian corn, fish, and sour wine appear to be their only resources. The surrounding country is very barren. Fossil remains are numerous at Rogosnizza; also at several of the islets in its neighbourhood.

DIRECTIONS.—To enter this port, of which the entrance is open to the north-west, a large vessel should pass north-westward of all the rocks off it. At nearly $3\frac{1}{2}$ cables northward from Smoquizza islet is a shoal of 3 fathoms. A small vessel may take the narrow passage between the south extreme of the port and the rocks off it, but should be on her guard against the current, and be prepared to anchor immediately.

* See Plan of Port Rogosnizza, No. 1,622; scale, $m = 1\cdot3$ inch.

CHAPTER IX.

EASTERN COAST.—DALMATIA ; PLANCA POINT TO MOUNT
ULACO, AND ADJACENT ISLANDS.VARIATION, $12\frac{1}{4}^{\circ}$ to $11\frac{1}{4}^{\circ}$ West in 1861.

THE above limits include an extent of about 90 miles of the Dalmatian shore, and ten adjacent islands. This coast presents a diversified appearance of fertile, well-cultivated country, and dry barren shores, with high, bare-topped mountains in the rear.*

The islands, which form the third group eastward of Planca point, instead of running parallel with the coast as those described in the previous chapter, lie perpendicularly to it, the greatest length of each being in an east and west direction. The olive and the vine are cultivated on them. The inhabitants subsist chiefly by fishing in the numerous and productive channels. Few of the islands afford fresh water.

PLANCA POINT.—Vessels often make this point in their way up the Adriatic : it is composed of white rocks, and, like the adjacent shores, steep and inaccessible ; off it is a long low rock, nearly even with the water's edge. On its south extreme are the ruins of a small church, and close to the northward, mount Movar, of barren and whitish aspect, rises about 86 feet above the surrounding ground ; it is crowned by a stone pile.

The currents are rapid in the vicinity of this point, and sea-winds cause considerable eddies around it.

TRAU VECCHIO BAY.—Between Planca point and Zirone channel the coast forms three rather deep bays with steep rocky shores, which afford shelter from all but westerly winds. The largest and best of these is Trau Vecchio, which is open to the south-west, and in which vessels moor in 11 to 17 fathoms hard mud. On the eastern shore, between the little round Merara rock and the village, there is a rocky bank in the north-west part, where also the holding ground is, generally, bad and the sea most felt.

There is a safe passage between the two small Muia rocks near St. Arcangelo rock, off Trau Vecchio point ; St. Arcangelo is a good dis-

* See Admiralty Chart : Adriatic Sea, Dalmatian Islands, from Sloselle to Ragusa Vecchia, No. 204, scale, $m = 0.2$ inch ; and from Port Rogosnizza to Meleda Island, No. 2,712 ; scale, $m = 0.4$ inch.

tinguishing mark for the bay, being, with the exception of Planca, the highest part eastward of this point, covered with trees and surmounted by a tower and the ruins of a chapel.

At the bottom of Trau Vecchio are the ruins of ancient Trau.

ST. ARCANGELO ANCHORAGE is a small space formed by St. Arcangelo and Merara rocks, which is secure from all winds and of easy access and exit. Vessels usually moor with open hawse to northward, or lay an anchor out northward and make fast to the rock.

If this anchorage should be missed by a vessel running from northward for shelter under Planca point, she should pass outside of all the rocks near the shore, and proceed through Zirone channel to Port St. Giorgio in Zirona Grande island.

PORT MANDOLER is a narrow winding opening in the main-land opposite Zirona Grande island, which affords shelter to small vessels from all winds in 4 to 8 fathoms, abreast of some dwellings on the northern shore. Off the mouth of the port is the small Mandoler rock, either side of which may be taken on entering.

ZIRONA GRANDE is lower than Mount Gelinach, on the main land, about 2 miles northward from it, and rather higher than Zirona Piccola, which it resembles as to cultivation of the lower grounds and barrenness above. Off the east extreme are shoals terminated by two small rocks, about 4 cables from the shore; the rest of the coast is quite safe. There are about 1,100 inhabitants, who cultivate the vine, the fig, and the almond.

ZIRONA PICCOLA is of moderate elevation, barren at the summit, with cultivated patches below. It is of bold approach, and temporary shelter from a bora gale may be obtained under its south-west side at about $1\frac{1}{2}$ cable from the middle part of the coast, in 8 or 9 fathoms, sand and weed. On this side are a few shepherds' dwellings.

At about half a cable from the west extreme of the island is a rocky shoal on which there is little more than one fathom.

PORT ST. GIORGIO, on the north-west side of Zirona Grande, affords good anchorage. Large vessels anchor near the middle in 13 to 16 fathoms sand, and secure to the shore. The two points forming the entrance of the port are very high and covered with trees; on the one at the starboard hand is a church, which is visible at a considerable distance.

Supplies.—Water and provisions in small quantities may be procured.

ZIRONE CHANNEL is a narrow passage between the Zirone isles and the main, which has sufficient depth for vessels of the greatest draught.

Abreast of Zirona Grande the width is less than one mile. At the west entrance is the small low Muvrizza rock, around which shoal water extends about half a cable.

In taking the west entrance a vessel should pass between Muvrizza rock and Zirona Piccola. In taking the east entrance, the shore of Zirona Grande should be closed in order to leave on the starboard hand the line of small rocks off Gelinach point. Violent squalls reach this channel, especially in south-easterly winds; these winds greatly accelerate the current through it.

There is a narrow passage between the two Zirone islands, but it is seldom used, as the current causes considerable eddies in it, and as a rocky bank, with less than 2 fathoms on it, lies in the centre, about $4\frac{1}{2}$ cables southward from Malta rock.

BOSSIGLINA BAY, which is immediately to the northward of mount Gelinach, is an inlet of the sea, about $3\frac{1}{2}$ miles long and generally about half a mile wide. Its mouth is completely sheltered by Gelinach point, and its shores are bordered by high, wooded mountains, the seaward slopes of which are planted with vine and olive trees. In the middle is a depth of 12 fathoms, from which the decrease is gradual towards the bottom of the inlet, where lies the village. Large vessels anchor half-way between the two shores, with the chapel on the west side, bearing S.S.W. Small vessels moor in the various little creeks, and abreast of the village.

It is very difficult in contrary winds to work up to this anchorage among the outlying rocks, and difficult in southerly and south-westerly winds; it is impracticable for a sailing vessel in winds between north-east and south-east to quit it. For these reasons, Bossiglina bay is seldom visited by others than coasters.

BUA ISLAND is connected with the mainland by a swinging bridge, which permits the passage of vessels. It is low, and its appearance presents nothing remarkable. The higher parts are rocky and bare; below, the ground is well cultivated, and produces wine, oil, and fruit. There are about 1,600 inhabitants, and four villages, besides the village or town of Trau. On the west side there is a cove, well known to the islanders, in which a great quantity of asphaltum exudes.

The south coast, which runs parallel with the main, is rocky and steep almost throughout, and the depth close to is considerable. Bua forms, or helps to form, several anchorages.

ST. EUFEMIA ANCHORAGE is inside the rock of this name, near Okruch point, the western extreme of Bua, and is frequented by small craft which anchor in a channel about one cable broad, in 7 to 9 fathoms.

This channel has an eastern and a western entrance, and is therefore convenient for vessels meeting a contrary wind in Spalatro channel.

SALDON BAY on the west side of Bua is 25 miles in circuit. Vessels of large draught anchor near the middle, in 14 to 18 fathoms, gravel, with the old castle of Seghetto at the foot of mount Vlasca, on the main, bearing N. by W. Small vessels find good anchorage under the northern and southern shores, where they moor head-and-stern.

This port presents the same disadvantages as Bossiglina, and is therefore of little service as a place of refuge from bad weather. Winds between east and south, which would be favourable for vessels bound to the upper part of the Adriatic, would prevent them from quitting it.

TRAU CHANNEL is formed by the narrow space which separates the west side of Bua from the main; the name is extended to the interval between Okruch peninsula and the main. The portion which commences at St. Cipriano point is about $1\frac{1}{2}$ mile long, and less than 3 cables broad. Vessels of light draught anchor in 4 fathoms muddy, bottom, between the town, the point, and the main; and make fast to the island.

PORT TRAU is the small space between two jetties—one running out from Trau castle, and the other from Bua island—and the bridge which connects Bua with the town. It has a depth of 10 feet. The entrance is between the jetties. The channel which leads to the bridge is very winding, and has a depth of $7\frac{1}{2}$ feet.

Trau town, ancient *Tragurium*, is built on an island communicating with the other part of the coast by a bridge over a ditch which dries at low water. It is defended by a strong castle. The neighbouring country is well cultivated and very picturesque: the inhabitants, about 4,000, are very industrious, and many of them are good sailors. Surrounding marshes and the muddy bed of the channel between the town and the main at low water render the atmosphere unwholesome. Pliny alludes to the marble of Tragurium.

Supplies.—Water and provisions may be obtained in abundance. Vessels are repaired at Trau.

DIRECTIONS.—When approaching the anchorages of Bossiglina, Saldon, and Trau from any quarter, Mount Vlasca, which is one of the highest points on the Dalmatian shore, will be readily recognized. It is of barren aspect, and surmounted by the ruins of a telegraph tower.

In making for Trau channel, a vessel should steer for Seghetto fort, and, when about one cable from the shore, for Trau town. The anchor should be dropped at 2 good cables eastward from Cipriano point, which should not be closed on passing it, as shoal water extends southward from it to more than one cable.

When approaching by Spalatro channel, the passage between the point under Mount Gelinach, and Okruch point, will be readily recognised. After passing the small Macina shoal, which lies near the centre of Spalatro channel, the village on Okruch point should be steered for, and the three rocks St. Eufemia, Kraglievaz and Coparinovaz left on the starboard hand—the latter being passed at a short distance, in order to avoid the rocks and shoals which extend about two miles westward from Bazun rock. When the hilly Vraghizza point, which is on the right of the entrance to Bossiglina bay, and immediately opposite the passage, is seen, it should be steered for, and the small Selin rocks will soon be visible: these should not be closed; they should be left on the starboard hand if bound to Bossiglina bay, and on the port hand if going to Trau or Saldon anchorages.

CASTELLI BAY or CHANNEL is between the east side of Bua island and St. Giorgio point, the western extreme of Spalatro promontory, and terminates westward, in Trau channel.

The only anchorage is near the centre of the bay in 22 to 12 fathoms, hard mud; it is sheltered from the violence of northerly winds by mountains near the shore, but is exposed to bora gales. The shore of Bua between Giova point and Trau town is quite exposed to the bora, and affords no shelter.

The northern coast is bordered by rocks awash, which extend to a distance of nearly 2 cables, and numerous others on the eastern side render access to Spalatro and Vraghizza villages difficult even to vessels of very light draught. At the western angle of the bay are some mud flats, deposited chiefly by a rivulet which there falls into the sea.

Under Mount Marian is a small bay, the shore of which is bordered by rocks and shoals. Vessels when unable to reach Spalatro harbour sometimes anchor westward of St. Giorgio point, between it and this bay, in $5\frac{1}{2}$ to 14 fathoms, muddy bottom.

Salona, which is built on the ruins of the ancient *Salona*, the birth-place of Diocletian, is now an insignificant, but picturesque village. The small river of this name, which is navigable for boats, and whose source is at the foot of Clissa mountains, disembogues here. There are several other villages which are termed "Castelli," whence the name of the bay.

DIRECTIONS.—The chief entrance to Castelli bay is between Giova and St. Giorgio points; the passage to it through Trau channel can be taken by vessels of very light draught only. The former, which is about one mile broad, is free from dangers; in working through it in a bora, which wind sometimes blows very heavily here, a vessel should be prepared for violent squalls from the high lands.

The position of the bay is plainly indicated by mount Marian on St. Giorgio promontory, which is barren, of little elevation, and appears from the offing to be detached from the adjacent ground.

PORT SPALATRO [Sclavonic *Split*] is 2 miles eastward from St. Giorgio point; the intervening shore is rocky and steep-to. Its width at the entrance is about half a mile, and its depth rather less. Large vessels may anchor temporarily between St. Stefano and Botticella points, which form the entrance, in 7 to 12 fathoms, and as the bottom rises gradually towards the shore they might ride out a gale from seaward, but they would be exposed to a heavy swell, especially in a south-west wind. Vessels drawing less than 8 feet find refuge inside the town pier; in winter, a smaller mole to the northward of it should be preferred.*

The shores are bordered by rocks, some of which are always covered: both St. Stefano and Botticella points must be avoided, as shoal water extends to some distance from them.

Mount Marian on the west, and Clissa castle on the east, are good guides to the port at a distance; at a nearer approach the numerous edifices and steeples of the town will be seen. Clissa castle is about 4 miles from Salona, and is supposed to be the ancient *Andremetum*; it is very strong, both by nature and artificially, and completely commands the defile between the mountains.

If a vessel in this neighbourhood should be unable when caught in a bora gale to reach either this or Castelli anchorage, she should bear up for the west side of Brazza island.

Spalatro town, which contains the ruins of the palace of Diocletian, is the capital of the department of Spalatro, and the most important town in this part of Dalmatia; its population is estimated at 10,000 persons. The adjacent country, which contains several suburbs, is very fertile, and richly cultivated. Horses, cattle, wool, cotton, silk, figs, bees-wax, and copper are the exports: timber for ship-building is grown, and near the town among the vines is a wild cherry, from which is extracted the maraschino of Zara: Spalatro is the chief outlet for the produce of Bosnia. The town is defended by imposing fortifications.

Supplies.—Water and provisions may be procured in abundance. There are facilities for heaving down and repairing vessels.

SOLTA ISLAND.—This appears to have formed part of Brazza island, from which it is separated by the narrow Spalatro strait. It consists of numerous low rocky hillocks partially wooded: Mount Strazza (712 feet)

* See Plan of Port Spalatro, No. 1,612; scale $m = 5 \cdot 8$ inches.

which is the highest point of the island, is on the west side; and upon it are the remains of a telegraph station. Solta contains about 2,000 inhabitants; it affords some excellent pasturage; many parts are well cultivated and produce wine and oil, also honey of exquisite flavour. Between Solta and Brazza is a rock inhabited by rabbits.

The south-west coast, which is rocky and steep, is completely exposed to sea-winds, from which it affords no shelter whatever.

At the western extreme, off which lie several rocky islets, are two coves in which vessels of moderate size find shelter from all weathers.

PORT OLIVETO, ancient *Olynta*, the more northern of the above-mentioned coves, affords better shelter and is more accessible than the other.

When bound to it from northward, the passage between Stipanska and Palibornac rocks should be taken, and the vessel should haul to port directly after passing the latter close to its western side. Stipanska is the largest and outermost of the group of rocky islets, and is planted with olive trees. When bound to this cove from southward, Balun rock should be steered for, and the passage taken between it and the high point of Solta, upon which stands St. Nicolò church. Balun is next in size to Stipanska rock and is covered with brush-wood. In taking this course, Rotol rock, the south-westernmost of the group, should be allowed a berth of more than one cable on passing south-eastward of it.

PORT CAROBER lies at about the middle of the north coast of Solta, and is frequented by coasters, which moor in the centre of it, and lay out cables to the shore, near some store-houses. The position is easily recognized by a precipitous point 690 feet high, and covered with vines, contiguous to a tract of very low land; and on a near approach a grotto will be seen at the western point of the port.

PORT SORDO, which is close to the eastward of Carober, is used in southerly and westerly winds, by larger vessels than those frequenting the latter. The anchorage, immediately inside of Raad point, which protects it on the north-east quarter, is in 9 fathoms, muddy bottom.

The north coast of the island feels the full force of northerly and north-easterly winds, and the last mentioned two ports are the only shelter whatever from them which it affords.

SOLTA CHANNEL.—In taking this passage to Spalatro channel, between Solta and Zirona Grande, the eastern extreme of the latter should be avoided, as the current, which is rapid and irregular in branching off to Zirona and Solta channels, sometimes sets upon it.

The passage is between Orud and Stipanska rocks, as close as possible to the latter, after passing which, Solta should be closed, in order to avoid being carried by the current near Macina shoal.

SPALATRO STRAIT which forms the shortest passage to the ports in the channel, separates Solta and Brazza islands; being less than four cables broad, it is of rather difficult navigation with contrary winds when the current is strong; the shore on either side should not be approached within at least half-a-cable, the Brazza side being preferred. When passing through from southward, Smerduglia rock will be seen abreast of the opposite entrance. When making for it from Spalatro channel it is customary to leave this rock on the port hand, and care must be taken not to enter Milnà bay, which lies south-eastward of it, in Brazza island, and which is sometimes mistaken for the strait.*

SPALATRO CHANNEL.—The breadth of this interval between Zirone islands, Solta, and Spalatro, renders it easily navigable, as the current, which sets to the westward, is not very rapid. The greatest depth is 36 fathoms, and the bottom, throughout, is mud.

Macina Shoal.—This dangerous rocky bank, at a depth of about 4 feet, is the only hidden danger in the channel; it lies immediately opposite the north entrance to Solta channel, about midway between it and Sta. Eufemia rock.

The COAST between Port Spalatro and Stobrez village, 4 miles distant, is inaccessible, and bordered by high land: about midway, at a few yards from the shore, is a small 5 fathoms' shoal, which is supposed to be the remains of an ancient dock.

The village—the site of the ancient *Epezio*—stands upon a projecting peninsula, near the mouth of Xernovizza river, and is visible at a considerable distance.

Xernovizza Bay is a small indentation into which the river empties itself, and on the eastern side of which small vessels anchor; the north-west side is full of shoals. The bora blows severely here.

The COAST between Xernovizza, and Cettina river, 8 miles eastward, is accessible throughout. The country for about a mile inland is richly cultivated, and sprinkled with numerous dwellings. Oil, wine, and maraschino are the products. The land rises abruptly at the margin of this cultivated ground, forming rocky mountains of whitish aspect, which afford protection from northerly winds to the vegetation below.

* See Plan of Spalatro Strait, No. 1,614; scale, $m = 1.9$ inch.

ANCHORAGE in good holding-ground may be obtained during a bora all along, and at a short distance from, this shore ; but the anchor should not be dropped near Lunga point, which runs out to a considerable distance, nor near any other of the most salient points.

ALMISSA PORT and ROAD.—The port, which is merely a cove convenient for boats, is between the town and a monastery on the shore, about half a mile eastward from it. The road has a depth of 14 fathoms, mud. Vessels of large draught should anchor with the monastery bearing about N.E., and moor with open hawse to the south-east ; vessels of smaller draught moor near the shore, to which they secure themselves against the bora, which wind, however, does not blow so violently here as on other parts of the coast.

Shoals have been deposited by the Cettina throughout the western portion of the bay formed by the coast at Almissa, commencing from the port ; there is a depth of about 14 fathoms at the eastern edge of the shoal water, close inside of which there is less than 1 fathom.

Almissa town—ancient *Onæum*—is on the left bank, at the entrance, of Cettina river, and at the foot of a mountain, surmounted by an old castle. It was formerly a considerable and fortified place, and was destroyed by the Venetians, owing to the piratical practices of the inhabitants ; it is now almost deserted, being rendered very insalubrious by neighbouring marshes.

CETTINA RIVER—ancient *Nestus*—is one of the chief rivers of Dalmatia ; its source is at the base of Mounts Dinara and Ghgnat on the Bosnia frontier, whence it flows through Sign and Trigl, near Duare castle, where it forms the finest of its several cascades, and thence through Vissech to the sea near Almissa. It is navigated by boats drawing about 3 feet as far as the mills of Vissech : the bar, over which there is little more than 3 feet, is winding and difficult for strangers.

Mount Borac (2,900 feet), 2 miles eastward from Almissa, and about a mile from the sea, marks the position of the town and anchorage. Its peaked summit of naked rock commands an extensive view of the surrounding country.

The COAST between Mount Borac and Macarsca, about 18 miles distant, is bordered at a few miles inland by high rocky hills. At Vnullia is a sudden depression of the land, southward of which the latter rises to a still greater elevation than before, and maintains it as far as the mouths of Narenta river. The low grounds between the mountains and the sea are generally cultivated and contain several villages, of which Rogosnizza situated on an eminence is the most conspicuous, being visible from a considerable distance along the sea shore on either side of it.

There is no safe anchorage between the mount and Vrullia. Vrullia bay is dangerous, and also difficult of approach owing to strong eddies caused by subaqueous springs; the depth near it is considerable. The bora rushes with violence through the valley. The land in the vicinity has a barren, desolate appearance.

Between Vrullia bay and Macarsca town the coast resembles in appearance that which has been described, but the soundings, sandy bottom, are more moderate, especially off the points; and vessels anchor for shelter in a bora under the south-eastern shore of a small bend of the coast of Brelle village, and off the small Seline and Baskavoda villages, close to the shore, to which they lay out cables.

Water may be obtained at Baskavoda from springs.

PORT MACARSCA.—This little port, which is used by vessels of moderate size, is sheltered on the south-west quarter by a peninsular rocky point, but is visited by heavy bora squalls from the high land in its rear; the depth is $3\frac{1}{2}$ to 6 fathoms, mud. Coasters anchor on the north-west side, and make fast to piles on the beach.

The small town—ancient *Albius*—which is close to the water and rather picturesque, communicates with Spalatro, 28 miles distant, by a road which passes Almissa, and follows, generally, the trend of the coast; it carries on a small trade with Turkey.

Supplies.—Water and fresh provisions may be procured, and there are facilities for repairing vessels of small scantling.

Mount Biocovo—5,800 feet high,—is the highest and most remarkable of the mountains in the neighbourhood of Macarsca, and, like theirs, the upper portion is whitish and destitute of vegetation. When it is enveloped in fog, which rises in a scattered form, a strong north wind may be expected.

BRAZZA ISLAND.—The eastern extremity of this island, one of the richest and most populous of the Dalmatian islands, is 3 miles from the main land. The south side is the most elevated, and the slope towards the north shore is gradual. The hills are well wooded, and afford good pasturage. The lower grounds are well cultivated, and produce wheat, wood, oil, wine, and firewood. It contains about 15,000 inhabitants, who are very industrious and make good sailors, and 19 villages, the chief of which is Neresi, close to the sea near the middle of the south coast. Brazza is 21 miles long by 7 miles at its greatest breadth.

PORT ST. STEFANO, a small bay under St. Giorgio point, is the northernmost of the anchorages on this coast, which afford good shelter from the bora: the depth is 11 fathoms, mud; and the space is sufficient for

two or three vessels only. Vessels of any size may safely anchor in northerly winds outside the bay south-westward of the point at the left of its entrance.

BOHROVISCIA BAY, one mile southward from St. Stefano, and beyond a bluff, steep, rocky point covered with wood, affords shelter at its entrance; in a bora vessels of very light draught anchor inside, and make fast to the shore near the village. This anchorage, as well as that of St. Stefano, is difficult to reach in easterly, and both are open to westerly, winds.

PORT MILWA, which is the best of the Brazza ports, is perfectly protected from all but north-westerly winds; it is an excellent anchorage for a squadron of vessels-of-war. The outer anchorage is between Zaglava point and the entrance, in from 14 to 19 fathoms. Small vessels anchor in the middle of a channel about three-quarters of a mile long, at the extreme of which is the village.

Supplies.—Fresh provisions may be procured at the village, and slight repairs may be made.

SOUTH COAST.—Bol village is about midway on this coast. Near the centre of it is a cove, in which small craft find shelter. Large vessels anchor outside opposite the cove, or in 9 to 11 fathoms, sand, abreast of St. Nicolò church, which stands on a hill at the east extreme of the village; they lay out cables to the shore, if apprehensive of a bora gale.

Bol village is the centre of the trade of the whole island; it is rich and populous, and extends about two-thirds of a mile along the shore.

Supplies.—Water and provisions may be procured.

Mount St. Vito, height 2,625 feet, which is the highest point of the island, and at the foot of which Bol lies, points out the position of the anchorage at a great distance.

PORTS GIUSEPPE, LUCIZE, and OLIVETO, near the western extreme, are the only other anchorages worthy of mention on the south coast of Brazza, and these are available to small craft alone, which frequently await in one of the former two a favourable opportunity for passing through Spalatro strait. Oliveto, about 2 miles eastward from Lucize, likewise affords safe refuge to such vessels which, in all three, ordinarily make fast to the shore after anchoring.

EAST COAST.—ST. MARTINO ANCHORAGE which affords good protection from the bora, is, in about 7 fathoms, mud, abreast of the small Port Martino on the south side of St. Rocco point. Small craft anchor

inside. The woods on this part of the island are considered to break to a great degree the force of the bora.

St. Rocco point, upon which is a church, sufficiently indicates this anchorage.

NORTH COAST.—**LUCKE BAY**, near the eastern extreme, affords room for a few small craft, and is the port of Povie village; the other anchorages are merely small coves and creeks, frequented by boats which carry on trade with the main-land.

PORT ST. PIETRO, near the western extreme, is the chief of these small ports or coves on the north coast of Brazza; it is formed by two moles which afford protection from sea winds. Its position is denoted by a small church on the west point of the port, and by two low towers near the moles; also by the village, which is on an eminence.

Supplies.—Water and provisions may be obtained here.

BRAZZA CHANNEL is a continuation of Spalatro channel. It is exposed to sudden violent bora gales. The current is regular, but frequently rapid when Narenta and Cettina rivers are swollen. Near mid-channel the bottom is almost everywhere mud; along the shore of Brazza, and occasionally near the main-land, it is a mixture of mud and sand.

Two dangers, both rocky banks, lie in this channel. One in $5\frac{1}{2}$ fathoms, $1\frac{1}{4}$ mile from the shore, between Stobrez point and Spalatro, and about S.W. by W. $\frac{3}{4}$ W. from the former; the other, in $2\frac{1}{2}$ fathoms, rather more than one cable N. by E. $\frac{1}{2}$ E. from the extreme of the outer pier of Port St. Pietro, Brazza island.

The native pilots keep close to the Dalmatian shore, and do not navigate the channel at night.

The COAST of the main-land between Macarsca and the mouths of Narenta river is bordered by high land, presenting a few bare peaks, which is a continuation of that which is interrupted at Vrullia. Mount Sustvid (3,800 feet), which lies nearly north of the east extreme of Lesina island, is the highest and most remarkable of these peaks, and is of conical form. A few scattered villages may be seen, and the land appears fertile and well cultivated.

There is no port or good anchorage on this coast, of about 23 miles extent. Small craft occasionally anchor under it for shelter from a bora gale in about 9 fathoms at one cable from the shore, and when meeting contrary winds between the east extreme of Lesina island and the main, resort to Vicevich and Zaostragh bays, which lie north-eastward of the former. The former may be known by a small chapel on the star-board point of the entrance, and by some houses at the bottom of it;

the holding ground, mud, is good. The latter is marked by a convent on its north shore. The small vessels frequenting these little bays anchor in the middle of them, and, besides extra security seaward, against southerly winds, lay out a cable to the shore.

Narenta Channel is formed by the coast of Dalmatia, Sabbioncello, and the east extreme of Lesina island, and has a general depth of 31 fathoms. It is advisable, when proceeding up this channel, especially with northerly and easterly winds, to keep near the shores of Lesina and the mainland, where a favourable counter current will generally be met, as the Sabbioncello coast is iron-bound, and without places of shelter. The waters of the Narenta flow into the eastern part and cause a rapid westerly current, especially in the rainy season, at which period the water is frequently discoloured as far as the entrance of the channel.

NARENTA RIVER, one of the largest of Dalmatia, rises at the base of the mountains between Bosnia and Erzegovina, and after receiving the waters of numerous tributaries in the Turkish territory, enters Dalmatia at Metcovich village. Thence, prosecuting its course, it is joined by Norin river, and at Fort Opus branches off, and traversing a marshy country in numerous small streams, reaches the sea at the confines of the Austrian and Turkish territories.

The streams by which it discharges itself into the sea occupy an extent of $3\frac{1}{4}$ miles of a sandy beach interspersed with rocks, between two wooded elevations. Two of the streams are navigable, having a depth of 2 to nearly 3 fathoms, but the bars, on which there are but a few feet of water, render them inaccessible from the sea, excepting by boats, or vessels of the lightest draught.

Boats drawing not more than $4\frac{1}{4}$ feet proceed by the westernmost of the two navigable streams as far as Fort Citluc, at which is a poor Turkish village, the first one reached after leaving Dalmatia; boats of greater draught ascend to Norin tower, and thence by the river of this name to Vido, a mean village built close to the ruins of the ancient *Narenta*. Narenta valley is nearly uninhabited, owing to malaria arising from the extensive marshes; eels are in great abundance here.

Narenta town was formerly the capital of Dalmatia, and of great influence, exacting tribute from the whole of Dalmatia and from Venice for the right to enter the channel. More recently, it was governed by independent sovereigns and formed a separate duchy, which at this day is called the Erzegovina.

The COAST between the Narenta mouths and Klek bay, about $4\frac{1}{2}$ miles distant, is steep and rocky, and presents nothing more remarkable than a church and a few dwellings.

KLEK BAY is a narrow inlet about $3\frac{1}{2}$ miles long, which is shut in from the sea, excepting at its entrance at the north-west, by a high narrow peninsula which follows the direction of the coast. This peninsula is now claimed by Turkey. There are no hidden dangers in the bay, which has a depth of 11 to 15 fathoms, and it would be an excellent port for vessels of the greatest draught were it not in so inconvenient, isolated, a situation.

Smerdan Fort, now in ruins, stands on a high hill at the north extreme of the bay. There is no water, and the shores, which are well wooded, are uninhabited: the nearest watering-place is Briesta.

Stagno piccolo channel is the bottom or south-east extreme of Narenta channel, and commences at Klek point. The depth of water averages 11 to 12 fathoms, muddy bottom; there are no hidden dangers, and vessels of any draught may lie safely in any part; but the narrowness of the channel and the frequency of violent bora gales render its navigation difficult. Stagno piccolo town, almost in ruins, is near the south-east extreme; it is not visited by vessels of greater draught than 12 feet, as a rocky bank off it, with about that depth, bars the passage.

The shores of this channel are high and wooded, and the sinuosities are filled up with trunks of trees, from which the natives gather great quantities of oysters.

The whole northern shore of Sabbioncello peninsula is high, wooded, and steep-to, and affords no good shelter.

BRIESTA BAY, on the north shore of Sabbioncello peninsula, opposite Klek point, is a large bay encumbered by numerous rocks, and accessible to small vessels only. There are a few villages, the chief of which, Trapano and Duba, are easily recognized by their church steeples; the inhabitants carry on a small trade in cured-fish.

CAPE GOMENA, the west extreme of Sabbioncello peninsula, is lower and less steep than the rest of the coast. A rocky bank lies at little more than half a cable from it.

LESINA, the ancient *Pharos*, is one of the largest and most populous of the islands of Dalmatia, from which its eastern end, St. Giorgio point, is distant about $2\frac{1}{2}$ miles. The island is 37 miles in length in an east and west direction, by less than 2 miles average breadth. Nearly the whole of the south side rises abruptly, a chain of mountains at a short distance from the sea, extending from the west end along about two-thirds of its length. The highest of these, about 11 miles from the western point, is Mount St. Nicolò (2,100 feet), which has a chapel on its summit. From Mount Plana, eastward of Torcola islet, the height declines

gradually to St. Giorgio point. The elevated portions of the island present the bare appearance common in these parts; the lands sloping towards the north are well cultivated and abound in wood and pasture ground.

There are numerous villages, besides Lesina town, and, in all, about 16,000 inhabitants, who are considered good sailors and expert fishermen, and carry on a considerable trade in salt-fish and sardines, which are very plentiful on the coast; these, and wine of good quality, oil, wheat, honey, a great deal of which latter is exported, and firewood, form the chief products. The island affords various good anchorages in bora gales.

PORT CITTA VECCHIA is on the west side of a low fertile peninsula, which juts out on the north side of Lesina, about 9 miles from Pellegrino point, its west extreme. It is a fine bay open to the north-west, and well sheltered from northerly winds by a deeply indented spur of land which projects in a westerly direction from the north side of the bay, and terminates in the high and well wooded Cabal point. The bottom is mud nearly throughout Città Vecchia bay; at the centre it is sandy.

The best anchorage for small vessels is the little Port Zrignaloqua, the first or outer indentation on the north side. Vessels of large draught anchor in 14 to 21 fathoms at the entrance of this and of two other small bays on the same side, taking up a berth sufficiently near the shore to make fast to it if necessary. Coasters moor inside these bays, and also abreast of Città Vecchia village, at the bottom of the bay, which forms the port properly so called.

Città Vecchia, the most populous village on the island, carries on a great part of the maritime commerce of Lesina. Coasting-vessels are built here. Water and provisions of all kinds may be procured.

Between Città Vecchia and Verbosca there are but a few coves or creeks frequented by coasters, and the small village Rudine.

PORT VERBOSCA, which is on the east side of the peninsula above-mentioned, is protected from northerly winds by a low strip of land on the north side, which projects eastward, and the extremity of which is Glaviza point. Large vessels anchor in about 12 fathoms, mud immediately inside Glaviza point at a bend of the shore. Small vessels proceed farther inside. It is advisable to make very secure from bora gales by laying out cables north-eastward to the shore.

Glaviza point, when seen at a distance, resembles an island. St. Antonio point is bluff, precipitous, and covered with trees, and upon a wooded hillock on the left of the latter is a chapel; these points form the north and south extremes of Port Verbosca, and sufficiently mark its position.

Water may be obtained in abundance at the little village Gelsa, which lies in a cove between the two above-mentioned points.

PORT ST. GIORGIO lies about two-thirds of a mile from St. Giorgio point, which is low, of bold approach, and surmounted by a chapel. It is formed by a small mole, which affords shelter to coasting-vessels; near it, on the beach, is a tower. This is the principal—and may be said only—anchorage eastward, on the south side of Lesina which runs straight from east to west. But vessels of any draught may take temporary shelter from a bora gale under any part of the shore from Port Martiniska, which lies 4 miles from St. Giorgio point, to abreast of Cape Gomena of Sab-bioncello peninsula. The anchor should not be dropped in a greater depth than 18 fathoms, weeds, nor at much more than 2 cables from the shore.

PORT LESINA.—This, the only port of any consequence on the south side of the island, is about $3\frac{1}{2}$ miles from Pellegrino point. It is open to the southward, but somewhat sheltered in this quarter by the small Crisnirat islet. The anchorage is south-eastward of St^a Veneranda church, and it is customary to make fast to the shore. Vessels of light draught anchor in a cove between Batteria point and the point upon which stands St. Francisco convent. There is a boat cove near the Health-office. The port is much frequented, being on the route to Planca point, and to the various channels, and it is not unusual to see a great number of vessels moored in it towards the close of day when the weather threatens.*

Fort Imperiale, the citadel, is on a hill of marble, which points out the position of the port from all quarters. The passages to the port, which are those to Lesina channel, will be included in the directions for the latter at p. 177.

Lesina town contains about 1,200 inhabitants, it has quays, is extremely well built, and is defended by Forts Imperiale and Spagnuolo.

Supplies.—Water and provisions may be procured; also timber for the repair of vessels.

The SPALMADORES ISLETS and ROCKS lie immediately westward of Port Lesina. The south side of this group, which is quite exposed, should not be closely approached, especially in bad weather, on account of outlying dangers, and the rapidity of the currents through the narrow passages. On this side the islets are precipitous and of barren aspect: none of them are so elevated as Lesina; the highest and

* See Plan of Lesina Channel, No. 1,615; scale, $m = 1\cdot3$ inch.

largest of the group is St. Clemente, on the north side of which may be seen a few dwellings; they are covered with brushwood.

LESINA CHANNEL is formed by the south-west extreme of Lesina island and the Spalmadores islets. It is much frequented by vessels which trade on the coast of Dalmatia, as it is of easy access and exit in all winds, and affords good shelter from the bora, although heavy squalls are often encountered. The current is rapid, and in easterly winds it is difficult to beat up to an anchorage.*

ANCHORAGE.—The anchorage is good in this channel along the coast of Lesina, the depth at a short distance from it varying from 8 to 25 fathoms, mud and sand. The best shelter from westerly weather, which is often severely felt here, is at the bottom of the channel, under the lee of the isles, westward of Crisnirat rocky islet.

If unable to reach the south-east passage, a vessel may anchor in 8 or 9 fathoms, between Pocognidol rock and Batteria point; or off Jeronimo rock, between it and the shoal off it, making fast to the rock.

DIRECTIONS.—There are only two good passages to the channel, and to the port; the western, between Cape Pellegrino and the westernmost of the Spalmadores, and the south-eastern, between Batteria point of Lesina and Jeronimo rock.

The western passage, which is one mile broad, and quite safe, is preferable to the other when the wind admits of its being taken. When approaching from north-westward, Cape Pellegrino will be seen from a considerable distance, resembling a small dark mountain covered with trees; the rocks, also covered with trees, will afterwards be distinguished opening out to the right of the cape, and when abreast of the channel a tower on Batteria point, St. Francisco convent, and St^a Veneranda steeple will be plainly visible before the town itself is sighted. Cape Pellegrino and the south shore of the island may be kept rather closely on board if desirable, in order to take up a good berth.

The south-east passage is narrow and difficult, but very convenient in easterly winds. It should not be attempted without a good leading wind. As soon as Fort Imperiale is seen, it should be steered for, and the three objects above-mentioned will be plainly seen, St^a Veneranda steeple directly facing the mid-channel.

The small Pocognidol rock, which is the easternmost of the group, should be left on the starboard hand, and when Crisnirat rock is seen a course should be shaped to keep St^a Veneranda steeple just open to the right of it. The east side of the isles on the port hand should be passed

* See Plan of Lesina Channel, No. 1,615; scale, $m = 1\cdot3$ inch.

at some distance, in order to steer between two rocky shoals of about 4 fathoms, which in heavy weather might prove dangerous. When arrived between Batteria point and Jeronimo rock, a course may be steered for an anchorage in the channel, or for Port Lesina.

When working up from southward, the south side of Spalmadore islands should not be very closely approached, on account of the current setting between them. At nearly 3 cables westward from the two small Strambedar and Planchetta rocks is a little rocky shoal, with less than 3 fathoms on it; and Vodnach, the westernmost of the isles, has a shoal extending in some places to about 3 cables from it.

CANALE da GRECO di LESINA—Lesina North-east channel—or the passage between Lesina and Brazza islands, has a varying breadth of from 2 to 7 miles. There are no hidden dangers; the depth is from 30 to 40 fathoms, and the bottom is gravel at the west end, sand near the middle, and mud to the eastward.

This channel is seldom used, excepting by vessels bound to Macarsca on the main-land. The shore of Brazza should be kept on board, so as to be enabled to bear up for Port Città Vecchia or for Lesina, if overtaken by a bora, and as shelter from this wind may be obtained in the channel under Brazza, abreast of Bol village.

The current, which generally sets to the westward, is influenced at the most contracted part of the channel by north-westerly and by south-easterly winds; also by the waters of the Narenta.

TORCOLA ISLET, which lies about 2 miles from the centre of the southern shore of Lesina, is low and covered with bushes; it is inhabited by a few shepherds during the grazing season. The shores are of safe approach, excepting the east end, which should not be passed very closely. A church is conspicuously situated on the islet. There is no anchorage on the south side.

PORTO GRANDE, near the middle of the north side of the islet, has a depth of 3 fathoms immediately inside a projecting point on the eastern shore. It is customary to moor with one anchor seaward, and two cables laid out to the shore. Small vessels find shelter in two creeks in the south part of the port. The two extremes of this port are whitish points.

TORCOLA CHANNEL.—The passage between Lesina and Torcola islet, which is about $1\frac{1}{2}$ mile broad, is quite safe. The depth in the middle is about 36 fathoms, mud. It is difficult and often impossible to beat through from the westward, as easterly winds greatly accelerate the westerly current; but coasters frequently use this channel in order to keep to windward, in the event of a bora gale.

LISSA, the largest of the outlying islands, is 10 miles long from east to west, by about 5 miles broad. It presents the appearance, in all views, of an irregular, hilly mass, covered with trees; the highest point, Mount Hum (1,800 feet) is bare-topped and surmounted by a small tower, and when seen from south-eastward, eastward or north-westward, presents two distinct elevations, on the lower of which is a chapel. The south side of the island rises abruptly and is higher than the opposite, towards which the land descends in gradual well cultivated slopes, upon which are several towers. The shores are high and of bold approach, excepting in the immediate vicinity of the south-east shore.

There are about 5,000 inhabitants, who chiefly occupy two towns, one at the east and the other at the west extreme of the island; many of them are sailors and fishermen. Oil, wine, honey, and wheat in small quantities form the main produce, and considerable exports of sardines and of salt-fish take place. England had possession of this island from 1812 to 1815, and Lissa gives its name to an action fought by Captain Sir W. Hoste on the 12th August 1811.

PORT ST. GIORGIO is on the north-east side of Lissa, and bears S.W. from the highest of the Spalmadore isles. It is one of the chief ports of Dalmatia, and has sufficient space and depth of water to afford good shelter for vessels of the greatest draught. It is surrounded by hills.*

Vessels of large draught anchor in about 20 fathoms, sand and gravel, a little inside Spilica point, and at equal distance from the two shores; or farther inside, and abreast of the jutting-out point on the western shore, upon which stand St. Francisco chapel and the arsenal, where the depth is 10 to 14 fathoms, muddy bottom: Spilica is the west point of the bay; upon it are a chapel and a monument. Vessels of light draught moor in a small basin forming the south-west angle of the port, close to Lissa village.

A considerable sea is thrown into St. Giorgio by a bora gale, but the holding-ground is very good. Preparation should be made against a southerly gale, which sometimes comes on with little warning.

† "This is a very excellent harbour, without any danger going in or out. We have worked in and out several times in the 'Amphion,' passing between the small island‡ on the starboard side and the main; also between the small rock on the larboard side going in and the main-land of Lissa. In this harbour you may anchor in about 17 fathoms, sheltered from the sea in every direction except from N.N.E. to N.E. by E., and then the small island, bearing N.E. by N., breaks off the sea considerably.

* See Plan of Port St. Giorgio (Lissa), No. 1,618; scale, $m = 3.5$ inches.

† Remarks by Captain Sir William Hoste, 1809.

‡ Hoste island.

"To moor, lay your best bower to the south-east, and the small bower to the N.W., so as to have an open hawse to the N.E."

Supplies.—Water is very scarce, and in the summer season is conveyed from Comisa. Provisions may be obtained: also the means of repairing vessels. This was formerly the station of the Austrian marine, now transferred to Sola. There is a depôt of coals.

DIRECTIONS.—On arriving off St. Giorgio, St. Michele chapel will be seen on an eminence at the bottom of the port, and three towers on hills near the entrance, the highest of which, Bentinck tower, is on the port hand. At a near approach the outlying rocky islets will be distinguished, and the white houses of Lissa will mark the anchorage.

These islets are Vacca, the Vitelli rocks, and Hoste island: excepting in obscure weather, when from their greyish colour they are not conspicuous, they present no difficulties whatever; but it is advisable not to pass close to them without a commanding breeze, as the current generally sets towards them.

It may be convenient when the weather is not clear to recollect that by keeping the higher of the two towers on the starboard hand in one with the chapel on Mount Hum, a safe course between Vacca and the Vitelli rocks will be steered.

The entrance to St. Giorgio is difficult with south-easterly winds, as heavy squalls often render it impossible to carry sufficient sail. When making for this port from the eastward by Lesina channel, it is advisable to keep at a distance from the high lands, to avoid the strong sudden gusts which descend from them.

PORT CAROBBE.—This little port, close to the westward of St. Giorgio, is convenient for small craft when unable to reach the latter: the anchorage is at about one-third from the entrance towards the bottom of the bay, and beyond a cove on the south side. Between this cove and the entrance the bottom is rocky, and easterly winds are felt in full force. When entering, the shoal point on the port hand should be avoided.

COMISA BAY occupies the whole of the west side of Lissa. Westerly and south-westerly winds send in a very heavy sea, although Busi island defends it in some degree: it is protected from all other winds by neighbouring high land, and is a good place of refuge from the bora and scirocco.

The anchorage is about 4 cables westward from the village, in 8 to 11 fathoms, mud. Coasters moor in a cove near the village. Southward and south-westward of the village the bottom is rocky. The village consists of a few fishermen's dwellings.

Water may be procured near the village from the fountain, which occasionally supplies the inhabitants of Lissa village.

DIRECTIONS.—Mount Hum to the eastward, and Busi island, on the north side of which vessels must pass, sufficiently mark this anchorage. The western extreme of Lissa should be avoided, as rocks awash lie at between 5 and 6 cables from it. The two points of the bay are of bold approach; the southernmost, which slopes gradually seaward, is covered with pine trees. Working up under the land, a vessel should be prepared for heavy squalls.

Comisa bay and Port St. Giorgio, being on the route of vessels traversing the Adriatic, and to the southward of all the channels among the islands and to the shores of Dalmatia, are very important to the navigation of the Adriatic sea.

PORT MANEGO.—The coast, between Stupischi, the south-west point of Lissa, and the small Ravanik rock, is rocky and inaccessible. Temporary shelter from the bora may be sought under it, but the anchor must be dropped very close to the shore. Between Ravanik and the shore of Lissa is the small anchorage called Port Manego, which has a depth of 12 fathoms. It is exposed to northerly and south-westerly winds, and those from south-eastward send in a heavy sea, but the holding-ground is very good. The best berth is north-westward of the centre of the rock, and the best passage to it is from south-westward, between the rock and the island.

The COAST, between Ravanik rock and the east end of Lissa island, is bordered by rocks and shoals to the distance of about a mile.

BUSI ISLAND rises abruptly about 22 miles south-westward from Lissa; the depth around it is considerable. Three small rocky banks lie about $1\frac{1}{2}$ cable northward from its south point. At a distance Busi, which is a great rocky islet, with brushwood along its shores, shows a line of hillocks along its greatest length, or from north to south. The most elevated part, which is south-westward, is 780 feet above the sea, and on it are the ruins of a castle.

The only inhabitants are a few shepherds.

The CHANNEL between Busi and Lissa islands is quite safe, but Stupischi point should be avoided, as the westerly current turns suddenly round it, and a vessel might in light winds be set towards the foul north-west point of Lissa.

ST. ANDREA ISLET, about 12 miles westward from Lissa, has no bay or inlets affording refuge, and the numerous fishermen's boats which frequent it are obliged to seek shelter under its lee according to the

varying winds. This rock is 1,050 feet high, covered with wood, and surmounted by the ruins of a castle.

At about 2 cables from the south-west point of St. Andrea is a small shoal nearly awash, and at a mile westward is Kamnik rock, which has deep water around it: midway between the rock and the shoal is a depth of 55 fathoms, but this passage should not be unnecessarily taken as the current through it is irregular.

Another rock, smaller than Kamnik, which lies about 2 miles westward from St. Andrea, is surrounded by shoal water to about 2 cables. South-eastward, $2\frac{1}{2}$ miles from it, is a large rocky bank of 8 fathoms.

The currents in the vicinity of St. Andrea and its rocks are irregular, and cause strong eddies, especially in winter, and the depth is too great for anchoring. They should, therefore, be avoided, especially in light winds.

POMO ROCK, which is about W. by N. 13 miles from St. Andrea, and in the centre of the Adriatic, is a good point of departure for vessels bound from the Italian coast to Planca point, or to the channels leading to Zara and Spalatro; also for those navigating this sea at a distance from its western shore. It is a barren inaccessible rock, 108 feet above the water, of reddish hue, and, at a distance, resembling a vessel under sail. At rather more than $1\frac{1}{4}$ mile N.W. by W. from it is a shoal of about 11 feet water.

CHAPTER X.

EASTERN COAST.—DALMATIA; MOUNT VIPERE TO CATTARO,
AND ADJACENT ISLANDS.VARIATION $11^{\circ} 40'$ West in 1861.

BETWEEN Mount Vipere and the entrance of the Gulf of Cattaro is a straight line of about 45 miles. The shore is bordered at a short distance by mountains, with but little intervening space of cultivable ground. Oil, and wine which is considered the best in Dalmatia, are the chief products. The occupation of the inhabitants, generally, is maritime commerce.*

Curzola, Meleda, and Lagosta are the three principal adjacent islands: the others are thinly peopled or uninhabited. The bays formed by them contain abundance of fish, especially sardines and mackerel, but being destitute of fresh water they are seldom visited.

CAZZA ISLET is the outer extreme of a chain of islands and rocks which extend from the shore near Port Malfi; it is uninhabited except occasionally in the summer by shepherds who find pasture for their flocks. The north side is 840 feet high; the south side is lower, and forms a bay sheltered from northerly and westerly winds, but which is not safe anchorage, and a vessel caught in a bora gale off the island should, if possible, make for Lissa island; failing in the attempt she would have to bear up for Manfredonia.

CAZZIOLA ISLET is of less elevation than Cazza, from which it lies eastward 8 miles: it is uninhabited and covered with brushwood and stunted trees. The shore is steep and the surrounding depth of water, generally, is considerable; near it is a small rock, Bielaz, easily seen, and steep-to; off the south-west point of the island, at the distance of more than half a mile, is a rocky shoal with less than 3 fathoms on it; and Zernaz rock lies half a mile from the eastern point. Fishing-vessels resort in southerly winds to a small bay on the north side which has a depth of $12\frac{1}{2}$ to $17\frac{1}{2}$ fathoms, sand. The south-east side is the best for landing to cut wood.

* See Charts:—The Dalmatian Islands, Nos. 204, 2,712; scales, $m=0.2$ and 0.4 inch.

The channel between Cazza and Cazziola is wide and deep, and is used by vessels wishing to keep to windward.

MARCIARA ISLET is composed of several small woody hillocks ; the shore, close to which the depth is considerable, is steep, especially on the south-west side. There are no dangers in the channel between it and Cazziola excepting Marciara rock which lies nearly half a mile from its north-west point, and the small Zernaz rock. Vessels seldom take this passage, as the current is rapid.

LAGOSTA ISLAND,—ancient *Ladestum*.—This island upon which is a lighthouse, is generally made by vessels passing either up or down the Adriatic. It is high, with a peak near the centre ; the most elevated parts are well wooded, excepting seaward, where they are steep and barren. Mount St. Giorgio, the most elevated point of the island, is 1,430 feet above the sea, has a chapel on its summit and is covered with pine trees. There are about 1,000 inhabitants, mostly fishermen. Wine, oil, firewood, and salt-fish are the chief articles of commerce. The only village, Lagosta, is on one of the highest hills on the north side ; it is defended by a fort on a conical mount eastward of it.

PORT CHIAVE.—This is the only anchorage worthy of mention on the north side of the island ; it is of difficult access and resorted to by coasting-vessels for the convenience of its vicinity to Lagosta village, which is about one mile eastward of it.

A small rock at the narrow entrance affords partial protection northward ; the passage is on the east side of it, a reef of nearly awash rocks lying between it and the western shore. The anchor should be dropped near the middle in 5 or 6 fathoms, mud, and a cable taken to the rock. In this position, only northerly and north-easterly winds are much felt.

PORT ROSSO.—This very small harbour and the Lago ports are the best on the island. Rosso is at the north-east angle of a large bay : the depth in the centre is 5 to 6 fathoms, mud, and only $3\frac{1}{2}$ fathoms at the entrance, which is too narrow to be taken without a leading wind.*

The bay in which the port lies, on the south, has sufficient space and depth for vessels of the greatest draught, but it cannot be considered a safe anchorage, and should be resorted to only in the bora or in westerly winds ; those between south-west and south-east blow dead in and raise a heavy sea. Vessels anchor in 17 to 23 fathoms, near enough to the shore to enable them to lay out cables to it as security against the bora ; but the only

* See Plans of Ports Lago and Rosso, No. 1,649 ; scale, $m = 1\cdot3$ inch.

spot which can be recommended as shelter in a gale is in 18 fathoms under the lee of Skrigeva point, *i.e.* off the entrance of Port Rosso.

LIGHT.—There is a *fixed* white light on Skrigeva, the south extremity of Lagosta; it is 342 feet above the sea, and in clear weather can be seen at the distance of 21 miles. It is very important to the navigation of the Adriatic.

DIRECTIONS.—When entering Rosso bay with southerly or south-easterly winds, vessels should be prepared for being taken aback by eddies from the high land. The lighthouse point should be rounded closely when arriving from eastward, and Svegliegamora, the western point when arriving from the opposite quarter. In the latter case, care must be taken after passing the point not to approach too nearly the west shore of the bay, as two rocky banks lie about $1\frac{1}{2}$ cable from the most projecting part of it.

Between the north-west coast of Lagosta and Marciara are several rocky islands and islets which, with them, form good anchorages, the chief of which is Lago Grande.

PRESCIACH ISLET forms with Lagosta a narrow channel, consisting of Ports Lago Grande and Lago Piccolo, which are separated from each other by a rocky shoal over which vessels of light draught pass at high water from one to the other. The current between this island and Lagosta is rather rapid.

PORT LAGO GRANDE has sufficient space for a considerable number of vessels secure from all winds; but it is too narrow to be entered by sailing-vessels in northerly and south-easterly winds. Near the centre of it is St. Raffaele rock with a church on it, and there is anchorage on either the north or the south side of it in 12, 18, and 26 fathoms, sand and gravel. Vessels of light draught sometimes moor in St. Pietro bay on the south-east side, and also in a cove near the middle of the coast of Presciach. Brackish water may be had at St. Pietro bay near a church. Firewood is the only other article procurable.*

DIRECTIONS.—There are narrow passages to this port between Buschirat point and Bratinotoch rock; between the latter and Ulasgnich rock; and between Ulasgnich and Marciara and Presciach islets. A shoal extends rather more than one cable from Buschirat point. Irregular veins of wind frequently occur among this group of islands.

Cazziola islet and Mount St. Giorgio are good marks for the entrance when approaching from westward. Bratinotoch, which is a high wooded

* See Plans of Ports Lago and Rosso, No. 1,649; scale, m = 1·3 inch.

rock of whitish appearance, and steep on the south side, may be recognized at a considerable distance, and Buschirat may be known by large red patches on its south side.

LAGO PICCOLO, which affords good shelter from the bora, is of difficult entry and exit for sailing vessels: the depth of water is 18 fathoms, sand. The entrance is between the small Lucovaz rock, which has a shoal on its west side, and Pricodiscia point of Lagosta: the former is covered with bushes, the latter is high and steep, and at a distance resembles an island. Mount St. Giorgio, which is 2 miles southward, also helps to indicate the position of the entrance.*

The channel between Marciara and Presciach is frequented by coasting vessels for shelter from the bora; it is unsafe in north-westerly and north-easterly winds. The north entrance is eastward of the small Rutocgnach rocks. Both winds and currents are frequently irregular and strong between Lagosta and the small islands and rocks westward of it.

LAGOSTINI ROCKS consist of two groups eastward of Lagosta, which leave a safe passage between them and Meleda: the western group has 16 rocks; several of the largest are covered with bushes. The outer or easternmost, Marchintabila, is $3\frac{1}{2}$ miles from Nurigaham point of Lagosta, it is a small round rock over which the sea generally breaks.

Taino rocks are two small rocks of this group northward of the rest; they are $3\frac{1}{2}$ miles N.N.E. from the east point of Lagosta, and $2\frac{1}{2}$ miles northward from Marchintabila. The larger is whitish; the smaller, which is very low, has a burnt appearance.

Boscagne bank consists of dangerous awash rocks between Taino rocks and Marchintabila; it is not easily distinguished when the sea does not break over it; Taino rocks serve to indicate its position.

There is a passage, in taking which great caution is required, between the western group and the east point of Lagosta.

The eastern group, consisting of 9 small rocks, forms a line of breakers 3 miles in length. The easternmost, Glovat, a small round rock, is $7\frac{1}{2}$ miles from the west point of Meleda, and has 30 fathoms within a cable around it.

The passage between Marchintabila, on the west, and the low rock Ulasnich, the westernmost of the eastern group, on the east, is 3 miles broad. The current through it is irregular and sometimes rapid; vessels from southward prefer passing between the eastern group and Meleda. Close to Ulasnich are two other rocks of the same name. Between these

See Plans of Ports Lago and Rosso, No. 1,649; scale m = 1.3 inch.

three and the rest of the group, vessels anxious to keep to windward may pass, there being a channel one mile wide, with a depth of 5 fathoms. The Lagostini are frequented by fishermen.

CURZOLA ISLAND, ancient *Corcyra Nigra*, is one of the most important islands on the coast of Dalmatia. A chain of mountains, covered with oak and pine trees, suitable to ship-building, runs from one extreme of it to the other. The most remarkable elevation, Mount Zercerberdo, is 1,870 feet high, and presents either a conical or a forked summit, according to the direction whence it is viewed. The inhabitants, about 6,500, are few in proportion to the area of cultivable ground; their chief occupation is ship-building and fishing; the vine and the olive are grown. Horse-roads run from the various anchorages to the interior.

The coasts, generally, have deep water close to them; there are a few rocks, which will be described. The anchorages on the western side are very convenient to vessels navigating the eastern shore of the Adriatic, especially when overtaken by heavy southerly winds.

VALLE GRANDE.—This bay occupies the whole western side of Curzola, and has good anchorage for both large and small vessels.*

The best anchorage for the former is inside Oschiat, a moderately elevated islet covered with bushes. The available space is a square of about half a mile, with the depth of 18 to 29 fathoms sand, and it is well defended on all sides. The most secure place in the bay for small vessels is Port Plituine, a narrow indentation on the south side, north-eastward of the summit of Mount Hum. Here they anchor in 8 to 13 fathoms, sand and weeds, and make fast to the weather shore.

North-westward of Oschiat is the small port St. Giovanni, which has a depth of $3\frac{1}{2}$ fathoms, and is much visited by coasting-vessels, being conveniently situated for getting under way. St. Giovanni islet, which has a church on its summit, and is joined to the shore by rocks occasionally uncovered, forms its south side; the entrance is divided by the small Gobessa rock, to the northward of which is the proper channel. A strong outdraught sets through it at the commencement of ebb tide.

Immediately outside of the port is a small indentation, at the entrance of which small craft sometimes anchor against south-westerly winds, to which it is exposed, and make fast to the shore north-eastward. Farther north-westward, and opposite Camena rock, is a small bay, with convenient depth, sandy bottom; but it is quite open to the south-west. On the opposite shore of Valle Grande is Potplat bay,

* See Plan of Valle Grande, No. 1,611; scale, $m = 1\frac{1}{2}$ inch.

which has a depth of 10 to 15 fathoms ; but it is fully exposed to westerly winds, and in both the holding ground is insecure.

The smallest class of vessels find secure shelter at the east extreme of the bay near Blatta village, where cistern water and provisions may be procured.

DIRECTIONS.—Mount Hum, a high conical hill, completely covered with trees, is near the western extreme of Curzola, and indicates the position of Valle Grande. On approaching the land the high, wooded Kenirat point, south-eastward, and the low Liberano point, terminated by Proisdo rock, to which it is united by a reef, will be readily recognized ; and a course may be steered for Oschiat islet, leaving Camena rock on the port-hand. Both sides of Oschiat are clean.

The **SOUTH COAST** of Curzola, for about 10 miles from Kenirat point, has a chain of rocky islets running parallel with it : inside of these, small vessels find excellent shelter.

TRE PORTI is the westernmost of these anchorages. It has room for small coasting vessels only. The passage to it is between Chincia point of Curzola, and Terstenich the most westerly of the islets.

PORT CARBONI is formed by Curzola and Suirinovich islet. Its breadth is less than $1\frac{3}{4}$ cable ; it is $1\frac{1}{2}$ mile long, has a depth of 7 to 14 fathoms, weedy bottom, and is used by vessels of considerable draught, which lie secure from all winds. The ordinary anchorage is abreast of some fishermen's dwellings, from which a road leads to Blatta. Carboni is generally preferred by vessels wind-bound in this part of the Adriatic, as its two passages enable them to quit with any wind. Firewood is the only supply obtainable.

DIRECTIONS.—When approaching Carboni from southward, a course to the north of Marciara islet should be steered till Mount Hum bears about N.N.W. $\frac{1}{4}$ W. The mount should then be steered for to make Suirinovich, which at a distance appears like two islets, and is the largest of the small islands close to this shore.

When intending to enter the south-east passage, Obiach islet, which is sugar-loaf shaped, and covered with bushes at the top, will be recognized ; and the pass should be taken between it and Suirinovich to the westward. The small Gubessia rock lies in the middle of the pass, and should be left on the port hand.

When bound to Carboni from westward, all the rocky islets off Tre Porti should be left on the port hand, and a course steered for the west-extreme of Suirinovich. There is a shorter passage between Terstenich

and the four Persgnach rocks ; but the current, which is rapid between all these islets, should be considered before taking it.

PORT TRE POZZI.—The easternmost four of the chain of rocky islets, form, with Curzola, a channel nearly 4 cables broad, affording good anchorage in 16 fathoms, hard mud, between the easternmost two. Westerly and south-easterly winds send in a considerable sea, against which, however, vessels may lie secure if moorings be taken to the shore.

DIRECTIONS.—When bound to Tre Pozzi, Mount Zercerberdo should be brought to bear N. $\frac{1}{2}$ E., and steered for till the above-mentioned four rocks are seen. At a distance they present a low whitish line, standing out in relief from the dark ground of Curzola. Vessels visiting Tre Pozzi never pass between them, the breadth being small, the current strong, and the water shallow.

The eastern pass is between Bertovgnac islet and Bernasca point. The anchorage is just beyond the islet, which will have been left on the port hand. Bernasca point is high and well-wooded.

The western pass is between Cossod and Stuppa islets, borrowing on the side of the latter. When they have been recognized, an easterly course should be steered to pass between Stuppa and a small rock near a jutting out point, on which are several houses.

PORT BERNA, under the high Bernasca point, which should not be approached within 3 cables, has good anchorage for vessels of light draught, in 3 to 5 fathoms, muddy bottom. The customary precautions should be taken against the bora ; cables are generally carried to the shore northward, near some dwellings.

From Bernasca point to the low Speo, or east, point of the island, the shore is rocky and steep-to, uninhabited, thickly wooded, and without a single place of shelter.

The NORTH COAST, from Liberano point to about opposite the west extreme of Sabbioncello peninsula, is almost uninhabited, and covered with trees. The native mariners seldom approach it, it being a dead lee-shore in northerly winds, and without anchorage. The depth along it is considerable, except where a few small rocks lie at a short distance.

PORT RACISKIE, on the right of the entrance to the passage between the peninsula and Curzola, is a small cove open to the northward, with a depth of 6 to 13 fathoms, mud, in the centre ; the larger class of the small vessels which visit it anchor near the eastern shore, making fast to it ; others, on the opposite side.

Water may be procured at the town, which is on the south side; provisions are very scarce.

KNEŠA ANCHORAGE is about one mile eastward of Raciskie; small craft bring up in 3 to 5 fathoms, muddy bottom. Knesa rock must not be closely approached.

CURZOLA ANCHORAGE is a small bay at the east extreme of the north coast, between Curzola town and St. Nicolò point, on which is a convent; the entrance is a quarter of a mile broad. Vessels are exposed here to winds between north and west. Native craft lie under the south side of the town-pier, and in the north-east part of the bay; but in the bora season, little security is afforded.

Curzola town stands on a peninsular point, and is defended by Fort St. Biagio. It contains about 5,000 persons; it is the chief place of export for the produce of the island.

Supplies.—All kinds of ship supplies are procurable; but water is scarce. A considerable number of vessels are constructed with timber from the neighbouring forests.

Pedoccio anchorage is a small basin about one-third of a mile south-eastward of Curzola town, and is well sheltered from all winds; it has a depth of 6 and 7 fathoms, and is suitable to small vessels only.

CURZOLA CHANNEL.—This includes the space between the north side of Curzola, and the south sides of Lesina island and Sabbioncello peninsula. Although of considerable breadth, it is seldom visited, as it does not lead to any point of commercial importance on the Dalmatian coast. Coasting-vessels ordinarily pass northward of Torcola, especially when anticipating contrary winds, so as to be in a position to anchor, if necessary, in Porto Grande of that island.*

Bacili Rocks, which lie near the west extreme of the channel, are two nearly awash rocks one-third of a mile apart, and about $3\frac{1}{2}$ miles westward from Torcola; on their east side, the depth is not more than 5 fathoms at the distance of three-quarters of a mile. In easterly winds the current sets strongly between them.

Planohetta Rock is about $4\frac{1}{2}$ miles south-eastward from Torcola, and is less dangerous than the Bacili: it is low and flat, and when bearing about north-west or south-east has the appearance of two rocks. It should not be approached within $4\frac{1}{2}$ cables on the east side, there being a rocky bank with less than one fathom on it.

The eastern portion of Curzola channel, sometimes called Sabbioncello channel, is frequently visited by small vessels trading to the coast of

* See Plan of Curzola channel, No. 1,616; scale, $m = 0.7$ inch.

Dalmatia ; it affords good anchorage for vessels of any size all along, and at about half a mile from, the coasts in 18 to 36 fathoms, sand ; and supplies may be procured, which are not obtainable in Lagosta channel. But rocks and shoals, and a strong westerly current, often present considerable difficulties.

PORT BADIA.—Of the several rocky islets at the eastern entrance, Badia is the largest, and may be recognized by a convent on the south-east side. Between it, Plagnac rock, and the shore of Curzola, is the port of this name, which is one of the best sheltered spots of this part of the channel. The best berth is at little more than one cable from a convent on Curzola, in $6\frac{1}{2}$ to $9\frac{1}{2}$ fathoms, mud.

Water.—An abundant supply of good water may be obtained at the convent.

In approaching from northward, a vessel should keep on the Badia side, to avoid a shoal off Pedoccio point, which has a depth of $2\frac{1}{2}$ fathoms at its edge. When entering by the southern passage, Plagnac rock should be left on the starboard, and Petrara rock on the port hand, and care taken to avoid two awash rocky banks, one of which lies in the middle of the passage, and the other inside. The small Beretta rock should be left on the starboard hand, as the depth between it and Plagnac is only 10 feet.

DIRECTIONS.—The particulars already given of Torcola island, and Bacili and Planchetta rocks, suffice with reference to the western part of Curzola channel. When making for the passage between Sabbioncello peninsula and Curzola, Mount Vipere should be steered for. The entrance between Ossit point on the left and Racieski town is quite safe, and will be readily distinguished ; Ossit point, at a distance, appears to be a detached rock ; St. Giovanni point, which is high and surmounted by a convent, will next be seen on the left, and Knesa point, which is woody and of moderate elevation, on the right. Between these points the channel is very narrow, and off Knesa point is a shoal with 11 feet water on it. Proceeding eastward, the passage between Orebiccio village point and Stupe rocks may be taken, and then that between Due Sorelle and Gojac rocks ; or the former may be left on the starboard hand.

When entering Curzola channel from eastward, the Sabbioncello shore should be closed, and a course taken northward of all the rocks at the entrance. If a vessel should find herself near Maisan, a rocky islet covered with bushes, she should leave it a short distance on the starboard hand, and steer about N.W. till the small Lusnac rock, which must be left on the port hand, bears S.S.E., in order to clear all the shoals to the eastward and southward of Maisan. Lusnac is, or was in 1854, marked by a

floating *beacon* in 5 feet water, the upper part painted *red*, and the lower *white*. Ananash rock lies about 1 cable S.S.E. from Maisan.

The ordinary set of the current through the channel is to the westward, and its speed is sometimes considerably accelerated by strong easterly winds. Northerly and easterly winds are dangerous, as the north side of the island is then a lee-shore, and affords no shelter, and it is advisable in these winds to coast along the south side of Lesina, so as to be enabled, if necessary, to anchor in Torcola channel, or to run under the lee of Curzola. In southerly winds, Port Lesina, or some part of Torcola, or Port Luka, may always be reached

SABBIONCELLO PENINSULA.—The most elevated point of this singular peninsula, 38 miles long by only 4 miles wide, is Mount Vipere, 3,160 feet above the sea; it rises near the west extreme, and is the commencement of two chains of mountains, the northernmost of which borders the south side of Narenta channel, and the other runs along the coast of Dalmatia. Uniting, with a sudden depression near the middle of the peninsula, they form Giuliana valley, which is visible from a great distance seaward, and, owing to the violence of the bora, has a desolate, dry, burnt appearance. Eastward of the valley, the highest point is Mount Czarovichi, at about the centre of the northern shore of Meleda channel.

PORT LUKA is formed by the western extreme of Sabbioncello peninsula, between Cape Gomena and Ossit point: it is a small bay, the best sheltered part of which is the north angle, where small vessels anchor in 6 and 7 fathoms, and make fast to the shore. Shoal water extends from both points. Vessels arriving, unable in contrary breezes or light winds to stem the westerly current between the peninsula and Curzola, find this a convenient temporary anchorage.

ROSARIO ROAD is the most eligible anchorage on the north shore of the eastern part of Curzola channel: it has a depth of 5 to 7 fathoms, weedy bottom, westward and south-westward of a monastery, and there are facilities for making fast to the shore. A wide berth should be given near Orebicchio to St. Liberale point.

Water.—There is a copious spring near the monastery, to which the inhabitants of Curzola have recourse in times of drought.

CUCISTE ROAD is abreast of a village of this name, a short distance eastward of Rosario; here also are means of securing a vessel to the shore. Beyond Cuciste, at about a mile westward of Orebicchio, is a similar anchorage, abreast of a slight indentation of the coast, which is marked by a house overlooked by a Franciscan monastery on the eastern side.

Vessels may also bring up off Orebiccio village, but shoal water extends too far off to allow them to make fast to the shore, excepting to the westward of all the houses. The inhabitants of Orebiccio are chiefly sea-faring men.

PORT TESTENICH.—This is a semi-circular bay, about half a mile wide, which lies in Giuliana bay, and is open to the southward. It is resorted to by small vessels in the summer season, when only it can be considered safe: these anchor at the entrance in 16 fathoms, weeds, and lay out cables to the shores, eastward and westward, against the bora, violent gusts of which descend from Giuliana valley. Here they are partially protected eastward by a small peninsular rock, and are sheltered from westerly winds; those from southward send in a considerable sea.

On a projecting point near the middle of the bay is a small church, to the westward of which is the ordinary anchorage, abreast of some stone houses on the beach.

The COAST, eastward of Giuliana valley, to Vratnien point, the extremity of the peninsula, is high and of whitish aspect, with scattered patches of brushwood. It is almost uninhabited, without any good anchorage, and visited by sudden squalls from east-north-east, especially toward the close of day; it is therefore advisable to keep as close to the shore as possible, avoiding some rocks which lie at a very short distance from it.

Small vessels occasionally anchor near the middle of a small indentation of the coast called Port Prapratna, about 5 miles from Vratnien point, taking care to secure themselves well to the shore. There is no village in the immediate neighbourhood, but a path leads from the port to Stagno town, $6\frac{1}{2}$ miles distant.

LAGOSTA and MELEDA CHANNELS.—These may be considered continuations of each other; the former is between Lagosta island and Lagostini rocks southward, and Curzola island; the latter is formed by Meleda island and Sabbioncello peninsula.

In Lagosta channel the only dangers are Taino rocks, which have been described: the ordinary westerly current sets through it, and, when easterly winds accelerate it, troublesome eddies are caused at the western entrance. After passing Lagostini rocks, the Curzola shore should with a southerly wind be at once approached, in order to be in a position to take, when necessary, one of the anchorages at its western extreme. As there are none in the eastern part of the channel it would not be safe to be surprised by a sudden fall of wind succeeded by a sea. In the

winter season, the bora blows heavily in this channel, and it is prudent to endeavour to reach Port Rosso or other shelter at the first symptoms of its approach, to avoid the necessity of bearing up for Manfredonia, or of lying to under the lee of the island. In Meleda channel, the ordinary westerly set of current occurs, excepting in the winter season during easterly winds, when the direction is generally about west-north-west. Southerly and south-easterly winds raise a heavy sea, especially on the Sabbioncello shore, which it is then well to avoid, as they seldom blow home. With the bora, a vessel should keep as near as may be safe to this side.

MELEDA ISLAND.—This island, the *Melita* of the ancients, is the south-easternmost of the larger islands of Dalmatia. It consists of a series of wooded hills with a deep depression at about one-third from its east extreme, and appears, when seen from northward, like two groups of islets. Its highest point, Mount Grado, 1,706 feet, is near the centre: the north side of the island is wooded and well cultivated; the opposite is a rocky sterile country, excepting in the vicinity of the western extreme where there is an extensive pine forest. There are about 1,200 inhabitants, whose principal occupations are fishing and agriculture. There are six small, poor villages, the chief of which is on the southern slope of Mount Grado. The south coast is rocky, barren, and without any anchorage whatever, and should not be approached within one mile. The north coast is easy of access and has several good anchorages.

PORT PALMA is sheltered on its west side by Lastovska point, the western extreme of Meleda, and from north-easterly winds by a large rock, whitish at the base, and covered with brushwood at the summit. Southward of this rock, between it and the island, vessels anchor in 17 to 27 fathoms, and make fast to it. The passage is between the point, and two small greyish-coloured rocks on the port hand, on which side also the great Pomestach rock must be left. Lastovska point is an elevated strip of land and forms a good sea-mark.

PORT PALAZZO, about $3\frac{1}{2}$ miles north-eastward from Lastovska point, is in a bay formed by two points of the island, about 2 miles apart, and between which and four intervening rocky islets there are four passages. It has several good anchorages; the port, properly so called, is at the bottom of the bay, westward beyond the rocks, and abreast of the ruins of a palace, whence it derives its name, and has a depth of 7 to 10 fathoms mud; vessels also anchor between the rocks and the shore outside of the narrowest part of the bay, but here the depth is 21 to 26 fathoms.*

* See Plan of Port Palazzo, No. 1,613; scale, $m = 2.3$ inches.

The anchorage most frequented for temporary purposes is between Meleda and the long Kobraua islet in 17 to 22 fathoms, sand and mud; a better berth is more to the westward between Kobraua and Jasník rock. Palazzo is considered one of the best ports of Dalmatia; nevertheless, its limited space and numerous rocks render access difficult.

DIRECTIONS.—In making for Palazzo, Lastovska point will be readily recognized; the land is very thickly wooded, and the four above mentioned rocky islets present a barren, whitish aspect. In southerly winds a vessel should be prepared in the narrow passages between the rocks for sudden heavy squalls. In taking the western pass between Meleda and Morasnik islets, Rastuppa point should be closed to keep well clear of some awash rocks near Morasnik. A vessel of large draught may anchor temporarily in the small bay formed by Meleda, opposite the west side of Morasnik.

The other passages are free from hidden dangers, excepting a small shoal close to the north-east extreme of Uchliata islet.

PORT MEZZA MELEDA is about 8 miles eastward from Palazzo; the intervening coast is straight and affords no shelter. It consists of two bays and is a convenient spot for wind-bound vessels if a berth be chosen with reference to getting under way with a fair wind. The anchorage for vessels of large draught is in 35 fathoms sand in the westernmost of the bays. The northern shore, where the depth is 16 to 27 fathoms sand, should be preferred, being the best sheltered from winds from this quarter; the south-west side of each bay is bordered by rocks, and at about $3\frac{1}{4}$ cables westward from Badagn rock there is a rocky bank in 7 fathoms which should be avoided when taking up a berth between the two bays. The shores are skirted by well-wooded hills.

DIRECTIONS.—The position of Mezza Meleda is easily distinguished, being at the before-mentioned depression of the land. In passing between Pusta point on the starboard, and Badagn rock on the port hand, the former should not be closely approached, as a bank, terminated by an awash rock, extends nearly half a cable from its north-east point.

Grui point is the eastern extreme of Meleda and forms with Vratnien point the eastern mouth of Meleda channel, which is seldom entered, excepting by coasting-vessels on their way to Sabbioncello channel.

CALAMOTA CHANNEL is formed by the south extremity of Sabbioncello peninsula, and six small islands which run parallel with the coast of Dalmatia between Vratnien point and Port Malfi. It is 28 miles long, and the least breadth is $1\frac{1}{4}$ miles; the shores afford excellent anchorage, and the channel is one of the easiest to enter at all seasons of

the year, and may be included among the most important anchorages in the Adriatic sea. The holding-ground is good almost throughout.*

OLIPA, the westernmost of the small islands, forms with Vratnien point an entrance to Calamota channel called Bocca di Ladro, which is too long and narrow to be considered easy even with a commanding breeze; the steep, rocky shore is of bold approach; the summit of Olipa is covered with bushes; Vratnien point is quite uncultivated, and overgrown with impenetrable brushwood. A battery on each side commands the pass.

PORT LADRO is a cove on the north-west side of Olipa, in which a vessel of large draught may contrive to moor under shelter from all winds.

Water.—There is an excellent watering-place on the main land, eastward of Ladro and about one mile northward from Port Slano; it is in a little shingly bay, and may be known by a small church close to the beach.

JAKLIAN ISLAND, eastward of Olipa, forms with it the second narrow passage to Calamota channel called Bocca falsa, which is further contracted by a bank of rocks awash off the west extreme of the island. Four small rocks lie parallel with the north-east shore, forming with it several good anchorages. The first, or westernmost of these, in 18 fathoms, gravel and shell, is south-eastward of Tajan rock which is covered with brushwood; the second is south-westward of Zerquina rock in 15 fathoms, mud; and the third, or Port Galera has a depth of 14 to 16 fathoms mud. Vessels anchor with Cosmech rock bearing W. by S., or S.E. by E. and in either position are protected from the bora.

The passage between Jaklian and Olipa should not be attempted with south-east winds or with the bora; calms and current eddies setting upon the shore are of constant occurrence here; it is occasionally used in north-westerly winds. After passing Olipa the vessel should be kept close-hauled on the port tack until beyond Tajan islet, and certain of weathering Misgnak rock, as the wind often hauls more to the northward in Maestro bay.

This island may be easily identified; its centre is elevated and surmounted by a blanched stony peak; the north side is covered with brushwood interspersed with cultivated patches; the south shore is rocky and precipitous; there are a few houses on its eastern extreme.

GIUPANA ISLAND lies eastward of Jaklian with which it forms the third, or Pompejana, passage to Calamota channel; being tortuous and

* See Plan of Calamota channel, No. 1,582; scale, $m = 1$ inch.

very narrow it is seldom used, although there are no hidden dangers. If a vessel of large draught should be forced to attempt it, the Giupana shore should be kept close aboard so as to enable her to anchor if it should become necessary when at the narrowest part of the passage. Care must be taken to avoid the Jaklian shore, off which are several awash rocks.

Giupana is the largest and most thickly peopled of this group of islands. It may be recognized by the high coniform Mount St. Elia; the shores are rocky and bold; near the coast is a series of rocky wooded hills with fertile valleys; farther from the shore is a rich plain, upon which are grown the vine, the olive, and all kinds of fruit.

SCIPAN BAY and PORT.—The bay is a fine basin formed by the north-west coast of Giupana. It is well protected on all sides; the bottom throughout is hard mud, and vessels may safely anchor in any part, near enough the shore to lay out cables to it.

The port, which lies at the bottom of the bay, has sufficient space for a considerable number of vessels of the greatest draught, and it would be preferable to all the other Calamota anchorages if it were not so far from the main-land, and of difficult access in south-westerly winds. Luka village lies close to the shore.

MEZZO ISLAND, eastward of Giupana, forms with it the fourth passage to Calamota channel, and one of the best, especially in north-westerly winds; but the breadth is much reduced by the great barren Rudda rock which lies between the inner points of the two islands, and it would be impracticable to beat through with south-easterly or northerly winds, or in any other than fine weather.

There is a small rock close to Rudda, and another Marvich, off the north extreme of Mezzo; on the former are a few ruined houses.

A vessel unable to weather Rudda should not attempt to pass between it and Giupana, on account of a shoal north-westward of the rock which would necessitate too close an approach to the latter; she should rather anchor under the lee of Mezzo in about 22 fathoms.

Mezzo is the highest of the islands; its south-west and north-east sides are rocky, and the former is bordered at a short distance by reefs. It contains about 700 inhabitants, chiefly mariners; the soil is fertile, the vine and olive flourish, and numerous flocks of sheep find pasture.

ANCHORAGE.—This passage affords good anchorage for vessels prevented by calms or contrary winds from proceeding through Calamota channel, both in Port St. Giorgio, a small bay in Giupana, west of Rudda rock, where vessels come to abreast of the village in 8 to 11 fathoms excellent holding-ground; and in Mezzo road, another small bay, at the bottom of which is a village. The road is sheltered from easterly and

south-easterly winds, but those from westward send in a considerable sea ; the best berth is in the middle of the bay in 11 to 18 fathoms, mud and sand.

CALAMOTA ISLAND is the easternmost of the islands, and with Mezzo forms the fifth, or Calamota, passage to the channel ; being very short it is easily taken, even with a scant wind. Between the opposite points of the two islands is a rocky bank with little more than one fathom on it, and the proper pass is between it and Mezzo, but there is a depth of 8 fathoms between it and Calamota.

Calamota is smaller than Mezzo : the western portion is covered with pine trees ; on the remainder are grown the fig and the olive. It contains about 400 inhabitants.

St. Andrea, a barren rock 189 feet high, precipitous on the south-west side, and surmounted by a convent, lies half a mile southward from Mezzo, and serves to point out the passage.

ANCHORAGE.—The south-west shore of Calamota which is rocky and thickly overgrown with bushes, forms a bend, in which refuge may be taken from a bora, in 12 to 18 fathoms, at between $1\frac{1}{2}$ and 3 cables from the shore ; both inside and outside of this distance the bottom is rocky.

In the small Sugn bay on the south-east side of Mezzo, and westward of Poluga point, there is good shelter from northerly and westerly winds, but a heavy sea is sent in by those from south-east. The best berth is near the middle of the bay in 4 to 9 fathoms, sand ; the north shore is lined with breakers. When approaching from southward, a wide berth must be given to Mereizze point which is shoal, and 3 cables south-eastward from which is Donzella rock.

There is also anchorage near the middle of the small Port Calamota at the north extreme of the island. Vessels should not proceed far inside as there are shoals, and the point on the starboard hand should not be approached on entering. North-westerly winds only, are much felt here ; the holding-ground is good. Cistern water may be procured in small quantities.

Between Calamota island and Pettini rocks is the sixth passage, which is the most frequented, especially by vessels from the southward. The depth close to the rock is considerable, but as the current is strong they should not be closely approached. This passage may be easily recognized by Mount Petka, and by the Pettini, a line of small abrupt rocks of reddish colour near Petka point.

There is also a pass less than 2 cables broad between Petka point and the Pettini, which is sometimes convenient to take, in order to keep to windward in north-easterly winds. In the middle of it there is a rock

which dries at low water, and which should be left to the eastward, as there is a depth of only 18 feet between it and Petka point.

STAGNO CHANNEL forms the north-west extremity of that of Calamota, and affords good anchorage everywhere under its northern shore, between the entrance and Brozze village, the nearer to which the greater is the protection from south-easterly weather. It is not however often visited, being rendered very unhealthy, especially in summer, by north-westerly winds which traverse extensive salt-marshes; but it would be a convenient temporary refuge for a large vessel obliged to enter the channel by Bocca falsa, if unable to reach Maestro bay. Small craft moor abreast of Kobase village; also between the moles of Brozze.

The rise-and-fall of the tide is one foot to eighteen inches; at low-water the mud-banks at the head of the bay emit very noxious exhalations. Stagno town is nearly deserted and in a ruinous condition, but water and provisions may be obtained.

Maestro, or North-west, Bay is one of the largest and finest anchorages of Calamota channel. The northern shore between Port Slano and Budina cove should be preferred, and it is customary, in anticipation of a bora, to lay out cables to it. The depth near the middle is about 30 fathoms, greenish mud, and 11 to 22 fathoms, sand and mud, at a short distance along the shores.

In calms or contrary winds the coast between Budina and Dolli coves should not be approached, as submarine springs of water occasion considerable eddies. The small Budina bay and those of Dolli and Jansko afford good shelter to coasting-vessels.

PORT SLANO is a fine harbour between Dogna and Gorgna points, on the main land, opposite the north extreme of Giupana. It is better protected from the bora than any other of the Calamota anchorages, and is perfectly sheltered from south-easterly winds, in which it can be entered without any difficulty: the land-breeze which generally blows at night facilitates departure. The holding-ground is generally good, especially in Dogna cove: Olmine cove should be avoided as the bottom is rocky. Port Slano is so situated with regard to the two southern passages to Calamota channel that it may be entered thence in the heaviest south-east weather. It would, however, be then advisable for large vessels to proceed farther than the lee of Gorgna point.

When anchoring at the entrance of this port, a rocky bank nearly a cable eastward from Dogna point must be avoided. There is very good anchorage near Gorgna point, the sea sent into the channel by scirocco winds being but slightly felt here.

Water in abundance may be procured from a stream on the eastern

shore, not far from Slano village, which is near the bottom of the port and communicates by a good road with Ragusa.

ANCHORAGE IN MID-CHANNEL.—One of the best anchorages in Calamota channel is between Calamota island and the main. Large vessels seeking shelter from a south-east gale generally come to in 14 to 18 fathoms, sand and hard mud, with St. Andrea rock in one with the west extreme of Calamota; here the swell from outside is felt, but south-easterly winds seldom last long enough to raise a heavy sea. This anchorage may be easily reached in south-easterly winds, and can be quitted without difficulty with any wind; but as it is impracticable to lay out cables to the shore against the bora, it should not be resorted to with the intention of making a long stay.

Vessels never anchor in mid-channel when anticipating bad weather, but on entering from southward proceed to Port Malfi, or, if prevented by stress of weather, to Port Calamota.

PORT MALFI is formed by a bay about one mile long, with an average breadth of 2 cables. South-westerly winds raise a considerable sea, from which the only good shelter is in the coves on the western shore.*

The best anchorage for a large vessel is in Soline cove, with cables to the shore against the bora, which blows violently. Veliki-Zaton cove is fit for small vessels only. Malfi is preferred to Gravosa and Ombla, being of easy entrance in south-east winds, and easily quitted in those from north-west.

The shores are exceedingly picturesque, particularly at Mali-Zaton bay, at the foot of a mountain, the base of which is covered with vines and olive trees, amid numerous dwellings.

Water.—Vessels frequently visit this port to procure water on the northern shore, from a stream upon which are some mills.

When taking the channel from southward between Calamota and Pettini rocks, the entrance, which is immediately opposite, will be readily recognized, as also Daxa rock, which lies in the middle of the passage to Ombla and Gravosa, and upon which are some batteries and a convent.

OMBLA BAY.—Vessels anchor close to the winding northern shore of this long narrow bay, or rather creek, to avoid the bora, which sometimes blows violently in the direction of its length. Southerly and south-westerly winds send in a swell, but do not last long, and are never very inconvenient. Both shores are covered with dwellings amid gardens and

* See Plans of Ports Gravosa, Malfi, and Ombla, No. 1,582; scale, $\pi = 2.5$ inches.

other cultivated grounds, to which the inhabitants of Ragusa resort in the hot season.

Water.—A fine stream of excellent water, the ancient *Arione*, empties itself into the bottom of the creek. Boats drawing 8 feet ascend to the source about a mile distant.

Ombla, owing to its narrowness and length, is not easily reached without a good favourable wind, especially in the winter, when the outgoing current caused by the stream is very strong. In the event of the wind failing at the entrance, it would be advisable to come to between Daxa islet and Leandra point, on the port hand, in 18 to 21 fathoms, hard mud, and to warp to the anchorage, if not convenient to wait for a breeze.

Between Ports Malfi and Ombla the coast affords excellent shelter in from 18 to 21 fathoms, green mud and sand. This shore is sterile, and has few inhabitants: westward of Malfi it is covered with habitations and well cultivated. This east-end anchorage, and Port Malfi, are convenient in south-easterly winds for vessels bound to, but unable to enter, Gravosa.

PORT GRAVOSA, also called St. Croce, at the right of the entrance to Port Ombla, from which it is separated by Cantafigo point, has not much anchorage space, the shores and the bottom of the inlet being bordered by banks of mud, deposited in great quantities during heavy rains. Vessels belonging to Ragusa winter here, mooring in the middle, and securing to the northern shore. Violent squalls descend from the high land during the bora, and heavy gusts are felt in sirocco winds, but the water is always smooth. The shores, like those of Ombla, are strewn with villages, surrounded by cultivated grounds, which afford a pleasant summer retreat for the inhabitants of Ragusa. Vessels of considerable size are built of oak from the forests of Dalmatia, and of Meleda and Lagosta islands, the planking and masting being procured at Fiume.*

* "We anchored at Gravosa in 11 fathoms, mud, and moored head-and-stern to the north-east shore, where there are mooring bollards at convenient distances: we had $3\frac{1}{2}$ fathoms under the stern. This is a very snug harbour, with good holding-ground, sheltered from all winds, and capable of containing some 40 or 50 vessels. We found two French ships of the line, two Austrian frigates, 12 steam vessels of war, and about a dozen merchant-vessels. The line-of-battle ships were anchored in the roadstead, between Ombla bay and Daxa island.

* Remarks by Mr. D.H. Speer, Master, H.M.S. *Coquette*, 1848.

"There is a rock with 10 feet water on it off the north shore; it is marked by a pyramid beacon: there is a passage with a depth of $3\frac{1}{2}$ fathoms inside of it.

"It is advisable to moor to the north-east shore, as you are then greatly protected by the high hills from the bora, which blows violently here."

Supplies.—Water and provisions of all kinds may be procured.

DIRECTIONS.—In proceeding to Ombla, or to Gravosa, either side of Daxa may be taken. In passing to the southward, between it and the two hillocks crowned by a battery, the Daxa side should be preferred, as a low shallow point runs out from the opposite coast. Between the batteries near Lapad point, and the entrance to Gravosa, the shore should be avoided when anchoring outside, as it is bordered by rocks overlaid with mud.

St. Martino Bay, between Lapad point and Pettini rocks, is resorted to by small craft for protection against bora and scirocco gales. The anchorage is in 14 fathoms, between Mount Petka and Lapad points, both of which are high and covered with trees: the latter separates St. Martino bay from Port Gravosa.

DIRECTIONS.—Mount Tmor, which at an elevation of 3,040 feet commences the high land running parallel with this part of the Dalmatian coast, is a good mark for approaching from westward the various passages to Calamota channel: it opens well out on the left from the chain of mountains in the interior, and its bare round peak may be seen at a great distance overtopping the surrounding land. Mezzo, and then the other islands will subsequently make their appearance, and the choice of passage may be determined. When approaching from eastward the high land near Ragusa should be steered for as soon as visible, in order to profit by the westerly current along the coast. In south-easterly winds vessels should beware of heavy squalls out of St. Martino and Ombla, which come more from the eastward than the regular breeze; and Calamota island should not be closed, as it may become difficult to keep clear of the shore. The coast between Pettini rocks and Ragusa is bold, and covered with bushes.

PORT and ROAD of RAGUSA.—The port is a cove on the east side of the town, and has space for a few small vessels in about 3 fathoms. South-east winds cause a heavy sea at the opening, which is between two moles, rendering entrance difficult and sometimes impracticable.*

* See Plan of Ragusa with the Calamota channel, No. 1,582; scale, $m = 2.5$ inches.

The Austrian Lloyd's steam-vessels touch here twice a week on their way to Trieste. There is an electric telegraph from Vienna.

The Road is between the town and Lacroma island, and has a depth of 17 to 21 fathoms; it is exposed to a heavy sea in south-east winds, at the first symptom of which it is the custom for vessels to weigh and proceed to Calamota channel, or, if obliged to remain, to haul close under the north shore of the island, and make fast to stone pillars provided for the purpose. In this position they often ride out heavy weather. This anchorage is resorted to in the summer season only; it is almost the only one on the coast of Dalmatia at which cables are laid out to the shore against *south-east* winds.

Ragusa town is prettily situated; it is surrounded by a fortified wall, the greater part of which is washed by the sea, and is commanded by Fort Imperiale on a hill, 1,350 feet high. The environs are well cultivated, and have numerous handsome dwellings. Ragusa was formerly a rich republic of 40,000 inhabitants; and like Venice traded to all parts of the world; it has now dwindled to 10,000, chiefly mariners, who carry on a considerable commerce in arms, salt, rice, &c., which are exchanged for grain, wool, and cattle, brought by Turkish caravans from Erzegovina.

Water may be procured from an aqueduct near a lazaretto, at a short distance eastward from the town.

LACROMA ISLAND, the shore of which is rocky and steep-to, is of little elevation, and, when seen from south-westward, appears to be divided into two at the middle. It is surmounted by a fort.

Mount Sniegnizza is a good guide to Ragusa, from which it is about 11 miles southward. It may be easily recognized, being one of the highest points of this part of the coast, and lying 3 miles inland; its summit is bare, and between it and the mountains bordering the Gulf of Cattaro the land is low. On a near approach Fort Imperiale, which is visible at a great distance, indicates the position of the town and anchorage.

BRENO BAY.—Between Ragusa and Pellegrino point is an uninhabited, barren, rocky shore, close to which the depth is considerable. Immediately eastward of Pellegrino point is Breno bay, the east side of which affords good anchorage for vessels of any draught in bora and south-east gales; the bottom is greenish mud, mixed with shells and gravel, or with sea-weed. A heavy sea is raised by south-westerly and north-westerly winds, in which it is therefore necessary to avoid anchoring close to the shore. In these winds small craft generally resort to Port Praghlivaz, the little indentation between Ragusa, Vecchia town and

Praghlivaz point, where they secure to the shore, the anchor otherwise not holding in the weedy bottom.

St. Pietro Rock is nearly on a line joining the two outer points of the bay, and about 5 cables from Rat point, the extreme of the promontory upon which stands the town of Ragusa Vecchia; between St. Pietro and Rat point is an awash rocky bank.

Breno village, which is in a plain surrounded by high land, is rather extensive; the low grounds in its vicinity being well sheltered, are thickly planted with vines and olive trees.

Water is obtained from a river which flows out close to the village. The water of Gliuta rivulet, in the east part of the bay, is not drinkable.

DIRECTIONS.—Mount Strasischie which lies about east-south-east of the anchorage, and west-north-west of Ragusa Vecchia, is a good distant mark for vessels making for Breno bay. It is advisable to make the land well to the eastward, on account of the westerly current, and to leave Marcana rocks, and Pettini rocks of Ragusa, on the port hand in easterly winds, and on the starboard in westerly winds. Large vessels should take the passage between Pellegrino point and St. Pietro rock. There is a passage between the latter and Rat point, but intervening rocks render it rather hazardous to strangers. Small craft pass between Sustiepan point and the shoal north-westward of it.

PORT RAGUSA VECCHIA is a small bay between Rat and Sustiepana points, which is in some measure protected seaward by the above-mentioned shoal off Sustiepana point. It has space for a few small vessels only, which make the most of it by hauling close in to the shore and making fast to it. The soundings in the middle are 11 fathoms, mud and sand. A shoal with $1\frac{1}{2}$ fathom on it lies outside the centre of the line joining the points of the bay.*

Ragusa Vecchia village occupies the site of ancient *Epidaurus*, on the south part of the promontory which separates it from Breno bay; the inhabitants, who may number 3,000, are chiefly seafaring men. The ground in the immediate neighbourhood is well cultivated; at a very short distance the land is high and barren.

Supplies.—Water and provisions may be obtained.

PETTINI ROCKS of Ragusa, which are eight in number, afford tolerable protection seaward to both Breno bay and Ragusa Vecchia; they have a steep, rocky coast line, with deep water, especially on the south-

* See Plan of Ragusa with the Calamota channel, No. 1,582; scale, $m = 2\cdot5$ inches.

west side. The largest and highest, Marcana, is the easternmost, and is surmounted by some ruins; off its south-east extreme an awash shoal extends rather more than 2 cables, and there is a narrow passage between it and the other rocks, which are low, and almost uninterruptedly united by shoals. The westernmost rock is Bobara.

THE COAST between Ragusa Vecchia and the Gulf of Cattaro south-eastward, an extent of 18 miles, is rugged and of forbidding aspect. At a short distance the land is very high, and covered here and there with trees. The depth is considerable near the shore, and it would be dangerous to become embayed here, as the sea breaks heavily in strong sea-winds, and violent eddies are caused by the current during succeeding calms or light winds.

A rocky bank, with little more than one fathom on it, lies about 4 miles eastward from Ragusa Vecchia; it is nearly 3 cables from the shore, and abreast of some houses called Grossichi, on an eminence.

PORTS MOLONTA GRANDE and **MOLONTA PICCOLO**, about 6 miles westward from Cattaro, are formed by a small two-branched steep and rocky peninsula. The first and westernmost of these ports can be considered merely a temporary refuge from a south-east gale for vessels which may contrive to reach it before the wind has attained great strength. It is quite open on the north-west side, whence a heavy sea sometimes sets in. There are 18 fathoms, soft mud and sand, on the western part, and about 7 fathoms at the head of the port, but here several vessels have sunk, and fouled the anchorage. It is usual to anchor near the middle, and lay out cables to the shore against the bora.

Two rocks detached from the southern branch of the peninsula add to the shelter of the small anchorage of Molonta Piccolo, which is quite safe in the bora, and in north-westerly winds. South-easterly winds send in a heavy sea, but need not be feared if the vessel be secured well in a proper berth before the setting in of bad weather. The depth is between 5 and 6 fathoms, sand, gravel, and shells, good holding-ground.

Water of good quality, but not in abundance, may be procured here.

DIRECTIONS.—The small vessels which frequent Molonta Piccolo do not attempt it in rough south-easterly weather, owing to the sea, and out-draught, then found at the narrow entrance between the rocks and the main. Neither is it advisable to attempt to enter either of these ports early in the forenoon, as even a fresh south-east breeze commonly fails on a near approach to the land at that time, and a heavy sea would be probably encountered.

Mount St. Elia, which is 1,887 feet high, with a chapel on its summit, slopes to the shore about 3 miles to the northward; this, and the high lands of Cattaro southward, sufficiently point out the position of the Molonta ports, and on nearing the peninsula its greyish, wall-like sides will be readily recognized. The country in the vicinity is overgrown with bushes, and only a few huts on the declivities of the mountains are visible.

CHAPTER XI.

EASTERN COAST.—DALMATIA—ALBANIA; OSTRO POINT TO PORT PALERMO.

VARIATION, $11\frac{1}{4}^{\circ}$ West in 1861.

THE Dalmatian portion of this coast, from Ostro point to Mount Duboviza, embraces about 60 miles including the sinuosities of the Gulf of Cattaro. Like the rest of the coast of Dalmatia it has at a short distance from it, inland, a chain of mountains, and is generally of bold approach. The adjacent country is populous, well wooded, and very fertile; the vine is cultivated, and produces excellent wine.

The Albanian shore between Mount Duboviza, and Port Palermo, 130 miles distant, is elevated and bordered by a continuation of the high lands of Dalmatia, as far as the neighbourhood of Dulcigno, where it becomes lower; thence to Boiana river is a flat country. Between the Boiana and Medua it is slightly raised and has the appearance of a wall; inland of Medua nothing is to be seen but a vast sandy plain intersected by marshes and skirted by mountains. Southward of Medua the high lands in the interior disappear, excepting in the vicinity of Durazzo and to the southward of Cape Linguetta.

Almost the whole coast of Albania is composed of sandy bays, interrupted occasionally by elevated, steep, rocky points of land. Generally there are deep soundings, sandy bottom, between Cattaro and Medua; but between Medua and Aulona there are not more than 5 or 6 fathoms at more than a mile from the shore. Outside of this are shoals, which shift considerably during the heavy rains and when the rivers are full. The productions of the soil are wine, corn, oil in small quantities, and tobacco of good quality.

GULF OF CATTARO—or *Bocche di Cattaro*—affords excellent anchorage; it is often of difficult, and even dangerous, access and exit during about four months in the year, but it is second to few ports in the Mediterranean for a fleet of steam line of battle ships. It is about 16 miles in extent, from

* See Admiralty Chart, Ragusa Vecchia to Port Palermo, No. 205, scale, $m = 0.15$ inch.

west to east, and consists of four basins, viz., the outer, the western, the middle, and the eastern, basins. These are surrounded by high land, which, however, does not completely shelter them, for the greatest precautions are necessary, particularly in selecting the most eligible berths for anchoring, owing to the suddenness and violence of the squalls which rush down from the elevated valleys both on the north and the east sides. On the whole they may be considered, with the exception of the outer basin, good ports; and they have sufficient depth of water for vessels of the largest draught.*

On making the land to enter the gulf, Mounts Cassone, Sella, and Falcone, which surround the gulf, are excellent guides in clear weather, when they may be seen at a great distance. But in south-easterly and south-westerly winds they are generally clouded, and are not visible till sufficiently near for the low parts of the land to be seen. The southernmost mount, Sella, is, on approaching the coast from any quarter, the highest and most conspicuous, and, as its name implies, is saddle-shaped.

Winds.—The land wind in the Gulf of Cattaro often lasts till late, so that, on nearing Ostro point, a vessel may lose even a fresh south-east breeze: it is not prudent for a sailing vessel to close the land before 10 a.m. or after 3 p.m. It is necessary to be prepared for the bora, which, even in fine weather, often comes on suddenly with extreme violence. In the winter it is always difficult to distinguish the land about the entrance to the gulf in south-east, southerly, and south-westerly winds; indeed, it is then sometimes impracticable to enter.

LIGHT.—A *fixed* white light is exhibited, at an elevation of 263 feet above the sea, on Ostro point, on the western side of the entrance to the gulf. It is visible in clear weather, from the distance of 20 miles, and is an excellent guide at night for entering the gulf.

The OUTER BASIN is about $1\frac{1}{2}$ mile wide: the shores are inaccessible rocks, crested with brushwood. It is so exposed to winds and heavy seas from the south that it is not safe, and is only used as an anchorage when detained by calms, contrary winds, or currents.

Bocca Grande and Bocca Piccola.—These passages to the basins are between Ostro and Xaniza points, which are easily recognized, and from seaward resemble islands, owing to the extreme lowness of the immediately adjoining land. Besides the lighthouse, there are several forts on the former, which is of little elevation, and covered with trees: the ground abreast Xaniza point has a bolder appearance. The currents are

* See Plan of Cattaro gulf, No. 1,463; scale, $m = 1$ inch.

very rapid and uncertain in the Cattaro passages, especially in the Bocca Grande : after heavy rains they attain a speed of 2 or more than 3 miles an hour ; at other times they run to about half this rate : in the summer there is little current.

The Rondini Rock separates Bocca Grande and Bocca Piccola, and has a fort on it ; it is of bold approach.

Port Xaniza.—Vessels unable, or not wishing, to enter the western basin, can anchor in the little Xaniza bay, eastward of Rondoni rock, where they will be tolerably sheltered from sea winds by the point. At the extremity of this point, and joined to it by a shoal with about 14 fathoms water on it, is a rock, on which are a fort and the ruins of a large building. The best berth in this small bay is on the eastern side in about 18 fathoms, abreast of some houses on the strand ; for security against bora gales, hawsers or cables should be laid out to the shore.

If detained in the Outer basin, the anchor may be dropped about midway between Ostro point and Rondoni rock, in 35 fathoms good holding-ground, muddy bottom. But, if practicable, a berth near Lustiza point, on the eastern shore, should be reached.

If obliged to bring up in the Outer basin, care must be taken to avoid a rocky bank with 14 fathoms on it, about 4 cables long north-west and south-east, and 2 cables wide, which lies about 4 cables south-westward from Lustiza point. In the summer season it is advisable to keep near Lustiza peninsula, as the shore is bold ; and here the frequent calms under the lee of Kabila point may be avoided, and the anchor safely dropped if unable to stem the current. This is also a better position for encountering the heavy squalls which, when it rains on the mountains, become more easterly than the regular breeze. Care should be taken, if unable to reach the Western basin, to anchor in time to avoid being carried by the current into the north-west part of the Outer basin, where there is often a heavy sea, and the bottom is bad.

The three other basins are good ports, and have sufficient depth of water for the largest vessels. Near the centre of them the bottom is generally mud, which nearer the shores is mixed with sand and shells.

The WESTERN BASIN affords the best shelter, and anchorage is easily reached. Like the outer basin, it is surrounded by barren high land of whitish aspect. The south-west coast belongs to Turkey ; the remainder forms part of the Austrian department of Cattaro. Generally, it may be said that, if care be taken not to enter the gulf without a good breeze, the western basin may be reached without tacking.

Kobila Passage.—Between Kobila and Lustiza points, which form the passage to the western basin, the inner and outer currents meet, and with

southerly winds there is often a heavy sea. Sailing-vessels should not attempt it without the prospect of carrying with them a good breeze ; on both these points are batteries.

Caution is particularly required during the last three months of the year, and in January when southerly winds prevail ; even when these winds do not reach the pass they often send in a sea, aggravated by the current, which, in the winter season, runs here at the rate of more than 3 miles an hour.

Anchorage.—The best anchorage in the western basin is that of Kombur, along the northern coast, between Bocca Kombur and a lazaretto close to the sea-shore, about one mile eastward from the town of Castelnovo. Vessels anchor here and make fast to the shore, being well protected from sea winds ; and as the bottom rises considerably there is no risk of being driven ashore by them, although south and south-east winds occasion a considerable sea. This spot is safe from south-east, north-west, and west winds ; the last seldom blow longer than 24 hours. But a good look-out should be kept for the bora, which, by carrying away the shore moorings, might cause the anchor to be dragged along the deepening bottom, and endanger the safety of the ship.

Topia Bay is greatly exposed to sea winds, and is not a good anchorage, even in the fine season. The same may be said of the coast between Castelnovo and the lazaretto. At the bottom of this bay are extensive marshes, into which the torrent Sutorina empties itself, and the remains of salt-pits.

Port Rosa is a cove at the foot of Mount Lustiza, and opposite Castelnovo. It is less than $1\frac{1}{2}$ cable across the entrance, and has a depth of 6 fathoms, muddy bottom. It is well known to the native mariners as the first place of shelter from southerly winds, and they often anchor in it as a favourable position for a start outward, with the land breeze.

Castelnovo is a small town of 8,000 inhabitants, and directly opposite on entering the Bocca Grande. It is commanded by Fort Spagnuolo. The land in the neighbourhood on the north shore is well cultivated ; and provisions may be obtained. There is a watering-place near the lazaretto.

The MIDDLE BASIN.—The coasts of this basin form a triangle, with sides exceeding 4 miles in length. It is a capital land-locked port, and well sheltered from bora gales. Entry is easy in the season of north-westerly winds. In the winter it is of difficult, if not impossible, access to a sailing-vessel, not only on account of southerly winds, but owing to the strength of the current, which makes it useless to attempt to beat through the Kombur passage. Westerly winds are of little avail, as they seldom retain any strength in the Gulf of Cattaro. The land on

the south side is high, and the only dwellings are at the entrance of Kartoli bay. On the north-west coast the ground is low, well cultivated, and abounding in country houses, under the shelter of Mount Desviglie. The north-east coast is similar to that of the north-west, and is sheltered by the high lands of Mounts Sts. Elia, and Vermatz.

Kombur Passage is rather more than 4 cables wide. Vessels should avoid closing the northern shore after passing Kombur point, to keep clear of the Porporella, a small rock with about $1\frac{3}{4}$ fathom on it.

San Teodo and Kartoli Bays, in the south-east part of the middle basin, are separated by Stradioti, St. Michele, and Otok rocks; the first named of these rocks is the greatest, and is covered with bushes; the last, which is the westernmost and smallest, may be recognized by a monastery which stands on it. St. Teodo bay affords good anchorage in south-east winds, in which the water is quite smooth; the inclination of the bottom is favourable to holding on, in winds from the opposite direction.

Kartoli bay, which is little more than 3 cables wide, affords the best anchorage of the middle basin in south-east and north-west winds, and even in the bora, as owing to its distance from the high land it is comparatively little assailed by violent squalls from the valleys.

Caution must be used to avoid too close an approach to the eastern shore of St. Teodo bay, as, here and there, it runs out in shoal water. On the north-west side of Stradioti rock, for about half-a-mile are places nearly awash.

The EASTERN BASIN is still larger than the middle one, and consists of Cattaro bay on the east and Risano bay on the west.

Although there is good holding-ground in nearly every part of this basin, it is not often resorted to, owing to the difficulty of access, but a considerable number of native vessels winter in its various creeks.

The land squalls are heavier here than in the other basins; the high land rising abruptly from near the coast. The south-east wind is also dangerous, particularly under the northern shore, which it reaches in extremely violent, sudden, gusts. Northerly winds, though squally, never blow here with great strength.

The entrance to this basin, Le Catene, is rather less than 2 cables wide at the narrowest or north-east part.

Risano Bay.—Two small rocks surrounded by shoal water, and each of which has a chapel on it, lie in the passage to this bay, leaving a width of less than a quarter of a mile between them and Perasto, and of about half a mile between them and Le Catene channel.

The small town Risano,—ancient *Rhizenium*,—is in the north corner of the bay. The inhabitants are given to commercial pursuits. The land

in the vicinity is well cultivated, as is also the opposite shore of Costagniza. The coast between, westward, is sterile and almost uninhabited. The town of Perasto is immediately opposite Le Catene channel.

Water.—A cascade, called Sopot by the natives, issues from a cavern near the town. Water is also abundant in Morigna torrent opposite Risano, and along the shore of Perasto; at the Gliuta rivulet, close to the small town of Orahovaz, and the whole of the eastern basin is plentifully supplied by the high lands which surround it.

Cattaro Town, of 4,000 inhabitants, is at the south extreme of the bay, at the foot of a rocky hill, the summit of which is separated by a wide valley from the steep mountain range of Montenegro. It is surrounded by an old wall, and protected by batteries, chiefly by the castle on the summit of the hill. It is about 2 miles north-westward of Mount Sella, the highest of the surrounding mountains. Stolivo and Persagno villages lie at the foot of Mount St. Elia, and are surrounded by gardens. Their inhabitants are all mariners, as are the natives of the gulf generally.

Montenegro.—The frontier of Montenegro is close to Cattaro, and the Austrians have carried up to it, by numerous zig-zags, an admirably constructed military road. Cettigni, the capital of the principality, is distant a ride of six hours. The market held outside the eastern gate of Cattaro is frequented by the Montenegrins, whose rich dress and silver-mounted arms are much admired.

DIRECTIONS.—When bound to the Gulf of Cattaro, it will be advisable to make the land from the westward on account of the currents, and to steer for Mount Sella to ensure a good position for entering. If the land should be made when steering perpendicularly to the coast, Mount Cassone will be a good mark for the entrance.

When prevented by unfavourable winds from entering the gulf, vessels anchor, especially in the favourable season, on various parts of the coast, at about a cable's length from the shore, in rather less than 30 fathoms, good holding-ground, and occasionally make fast to the shore. But excepting for momentary purposes or in urgent cases, it is better to repair to Traste bay, which will be described hereafter.

In the summer season only, vessels may anchor in about 54 fathoms, good holding-ground, if, on nearing the entrance of the gulf and being unable to enter, they should fear being driven to leeward by the current.

On leaving the gulf during the winter, the rapidity of the currents often presents a serious, and sometimes dangerous, obstacle.

If, after having passed Kobilá point, a vessel should meet a southeasterly wind with a heavy sea and a flowing-in current, which when opposed by that from the interior sets towards the north-west part of the

outer basin, she should anchor immediately. She would then be in a critical position, exposed to wind and heavy sea, but she would thus incur less risk than in attempting to proceed, or in endeavouring to return to the middle basin before a sufficiently fresh favourable breeze to permit the stemming of the out-going current.

If the land-breeze should be lost before rounding Ostro point, it would be necessary to anchor in this bad position, for it would be impracticable to beat out against the current.

After passing Ostro point, if the vessel should be becalmed before having obtained a sufficient offing, she would be in danger of becoming embayed on the coast between Cattaro and Ragusa Vecchia. Care should therefore be used to take advantage of the land-winds which occur at all seasons, and to procure a sufficient offing before they are overcome by the sea-breeze.

TRASTE BAY forms a considerable part of the indentation of the coast between Remo point, which is low and of whitish aspect, and Sginhovaz point, to the southward, which is high and abrupt. Large vessels may moor in the middle, where there is a depth of 14 to 16 fathoms, mud ; but it is prudent to do so only in winds from west to east, round by north. In fine weather and in the bora there is good anchorage in a cove under Traste point, in not more than 3 or 4 fathoms. This spot is well sheltered from all winds : the only houses are here. The position of Traste will be readily recognized, being immediately opposite the low ground joining the hilly peninsula southward of the middle basin of Cattaro, with the land south-eastward, which rises at Mount Velagora, to the height of 1,378 feet.

On entering the bay, a wide berth should be given to Traste point, as it runs off shoal in a north-westerly direction to about $1\frac{1}{2}$ cable ; and in working up from the southward, care must be taken to avoid an awash rock in a small bay southward of Traste point, on the outside of which, for more than a cable, the depth is less than 2 fathoms.

ALBANASSI ROCK lies about S. $\frac{3}{4}$ E., $1\frac{1}{2}$ mile from Traste point, and about three quarters of a mile from the shore.

If overtaken by a bora gale near the coast between Sginhovaz and Platamone points, the best spot for anchoring is off a conical hillock, upon the summit of which is St. Elia chapel, in a depth of about 50 fathoms at less than $1\frac{1}{2}$ cable from the shore. But on the cessation of the bora, or the slightest indication of a southerly wind, vessels should at once get under way, as the latter often sends in a heavy swell beforehand.

THE COAST between Dulcigno and the vicinity of Medua diminishes rapidly in height. Near the shore there is generally a depth of 6 to 8 fathoms, sand, and there is anchorage all along between Dulcigno and the mouth of Boïana river during land-winds and the bora.

PILRIGNINO ROCK, about $3\frac{1}{2}$ miles south-eastward from Dulcigno, lies at rather more than three-quarters of a mile from the shore; it has a depth of 7 to 27 fathoms inside of it, is bold close to, and of a light reddish colour.

BOIANA RIVER has its source in Scutari lake, and empties itself at about 6 miles southward of Dulcigno. It is navigable by vessels of light draught nearly up to the lake, and by vessels of about 150 tons more than halfway; but it is dangerous during the heavy rains, when the current is very rapid and overflows the banks. The country is thickly peopled between the mouth of the river and Scutari, to a distance of 11 or 12 miles on each side.

The town of Scutari, ancient *Scodra*, called by the Turks Iscudar, is the capital of the province of Albania, and the residence of the governor. It is on the slope of a hillock crowned by a fort, on the south side of the lake.

The lake is nearly 30 miles long and 5 or 6 broad, and is in the middle of a fertile well-populated plain. It receives the waters of the Moracca and of several other rivers which flow from Montenegro and the mountains eastward. It has abundance of fish; large boats are employed on it.

THE GULF of DRINO affords good anchorage in the bora, which blows with great violence on this shore. Care should be taken to keep the lead going on approaching this part of the Albanian coast.

On the north part of the gulf, and opposite the highest ground to the westward, is the small Port St. Giovanni. Only small vessels anchor here in 5 or 6 fathoms, and they must take care to keep well on the west side and at a sufficient distance from the shore.

In the gulf itself it is necessary to anchor at a considerable distance from the coast, off which are numerous shoals formed by Drino, Malfi, and Hismo rivers,—especially off the mouths of the first two, where the depth is less than one fathom at more than a mile from the shore. The best berth is north-eastward of Cape Rodoni, which defends it from southerly winds, which frequently come on after north-easters in the winter season. A vessel is at a convenient distance from the beach and in about $6\frac{1}{2}$ fathoms, when in a line between the extreme of the cape and a small fort on a height at the east end of the bay. Small vessels should

Near the shore, between St. Stefano and Duboviza, may be seen a few houses and some cultivated patches; the higher grounds are covered with trees. This shore forms part of the territory of Pastrovicchio.

ANTIVARI BAY.—Between Mount Duboviza and Antivari bay the coast is rocky and uninhabited, and there is no anchorage. This bay could scarcely be said to afford anchorage, owing to its exposure to wind and sea, if its south-east part, where the holding-ground in 10 or 12 fathoms is good, were not in some measure sheltered by Antivari, or Lido, point. The old fort on the beach should be brought to bear E. by S. $\frac{3}{4}$ S., and Antivari point S.W. by W. Here, southerly and westerly winds will be felt, but the holding-ground is good.*

Care must be taken to avoid anchoring on a rocky bank which bears about N. b. E. $\frac{1}{2}$ E. $6\frac{1}{2}$ cables' lengths from Antivari point, and W.N.W. from the fort.

The position of this bay is pointed out by a high and round hillock on the east side of the bay, and at the foot of which Antivari point commences. The town of Antivari, ancient *Antibarum*, is built on a hillock, in the form of an amphitheatre, and is about a mile from the shore. It is fortified and surrounded by a wall. It is said to owe its name to its position, *opposite Bari*, on the Italian coast.

The COAST between Antivari and Dulcigno, about 9 miles to the southward, forms a large bay, in which a vessel may anchor, if able to reach it when overtaken by a bora gale, but she must approach the shore nearly to arrive at a moderate depth of water. On the west side of this great bay, near the ruins of Dulcigno Vecchio, is a rock joined to the shore by a shoal.

NOCE BAY, or cove, lies between the above-mentioned rock and Dulcigno; it has room near the custom-house, for a few vessels in north-easterly and easterly winds.

DULCIGNO ROAD.—This is a completely open anchorage, in 10 to 12 fathoms, off the walled town of Dulcigno, ancient *Olcinium*, which is in the form of an amphitheatre and, being upon a rather elevated spot, forms a good mark seaward at a distance of 12 or 13 miles. Dulcigno has two high square turrets and five minarets, of which the highest is near the landing-place.

The soil in the vicinity is extremely arid; but, in the spring, beautiful varieties of flowering shrubs fill the air with delicious perfumes.*

* See Plans of Antivari Bay and Dulcigno Road, Nos. 1,686 and 1,588; scales, m = 1'2 and 1'7 inches.

THE COAST between Dulcigno and the vicinity of Medua diminishes rapidly in height. Near the shore there is generally a depth of 6 to 8 fathoms, sand, and there is anchorage all along between Dulcigno and the mouth of Boïana river during land-winds and the bora.

PILRIGNINO ROCK, about $3\frac{1}{2}$ miles south-eastward from Dulcigno, lies at rather more than three-quarters of a mile from the shore; it has a depth of 7 to 27 fathoms inside of it, is bold close to, and of a light reddish colour.

BOIANA RIVER has its source in Scutari lake, and empties itself at about 6 miles southward of Dulcigno. It is navigable by vessels of light draught nearly up to the lake, and by vessels of about 150 tons more than halfway; but it is dangerous during the heavy rains, when the current is very rapid and overflows the banks. The country is thickly peopled between the mouth of the river and Scutari, to a distance of 11 or 12 miles on each side.

The town of Scutari, ancient *Scodra*, called by the Turks Iscurdar, is the capital of the province of Albania, and the residence of the governor. It is on the slope of a hillock crowned by a fort, on the south side of the lake.

The lake is nearly 30 miles long and 5 or 6 broad, and is in the middle of a fertile well-populated plain. It receives the waters of the Moracca and of several other rivers which flow from Montenegro and the mountains eastward. It has abundance of fish; large boats are employed on it.

THE GULF of DRINO affords good anchorage in the bora, which blows with great violence on this shore. Care should be taken to keep the lead going on approaching this part of the Albanian coast.

On the north part of the gulf, and opposite the highest ground to the westward, is the small Port St. Giovanni. Only small vessels anchor here in 5 or 6 fathoms, and they must take care to keep well on the west side and at a sufficient distance from the shore.

In the gulf itself it is necessary to anchor at a considerable distance from the coast, off which are numerous shoals formed by Drino, Malfi, and Hismo rivers,—especially off the mouths of the first two, where the depth is less than one fathom at more than a mile from the shore. The best berth is north-eastward of Cape Rodoni, which defends it from southerly winds, which frequently come on after north-easters in the winter season. A vessel is at a convenient distance from the beach and in about $6\frac{1}{2}$ fathoms, when in a line between the extreme of the cape and a small fort on a height at the east end of the bay. Small vessels should

anchor more towards the mouth of the Hismo, viz., nearer the fort and the custom-house. There is good anchorage all over the gulf in northerly and easterly winds, in depths of 8 to 25 fathoms, mud.

This gulf is the ancient *Apollonia*, the scene of Cæsar's narrow escape with his fleet.

DRINO RIVER, the largest of the three rivers above-mentioned, is navigable by boats as far as Alessio, ancient *Lissus*, a small town on a hillock in a fertile plain on the eastern bank, which is commanded by a fort. The Drino communicates with lake Ocrida.

CAPE RODONI is a rather elevated narrow promontory, steep and bare near the extremity, inside of which it is covered with vegetation and trees. It stands up conspicuously from the low adjoining ground, stretching out about 4 miles south-eastward, and is a good guide to Drino anchorage.

THE COAST from Cape Rodoni to Cape Pali, an extent of about 14 miles of low sandy beach, forms a rather deep bay, with a moderate depth of water. In the north-east part of it, temporary refuge may be sought from a bora gale, the soundings being between 4 and 7 fathoms at from 1 to 2 miles from the shore. At the south end of the bay shoals extend to a considerable distance off the mouth of the little river St. Stefano.

CAPE PALI, which is hillocky, and covered with trees, juts out about 2 miles in a north-westerly direction, the extremity being rather lower than near the middle; it is steep on the south-west side, and forms a good sea-mark on this almost uniformly low shore. It is bordered by sand-banks, and there are scarcely 2 fathoms at the distance of 5 cables from it.

Pliny states that fire sometimes burst out on this promontory, without doing damage, and Plutarch informs us that in the charming adjoining plain, the curious watched with pleasure the sports of nature at the fountains, from which issued, not water but, jets of flame, which did not injure either plants or trees.

DURAZZO BAY forms one of the best anchorages on the Albanian coast, and has room for a considerable number of vessels. Its limit are capes Durazzo and Laghi; the former is a high round sugar-loaf hill; the latter, to the southward, is of little elevation, projects but a short distance, is covered with brushwood, and has a tower on its summit. These capes form the only exceptions to the lowness of the shore on this part of the coast, and in south-westerly and westerly winds, when the weather is thick, it is very difficult to make out the land about the bay, in which

there are numerous shoals, and the depth is not more than 4 and 5 fathoms at about two-thirds of a mile from the shore.*

St^a Lucia bank runs out from Cape Durazzo about two miles in a south-south-west direction; at the edge of its spit the water suddenly deepens to 7 and 12 fathoms. Seleda bank to the southward extends from the mouth of the little Kovaia river to about $1\frac{1}{2}$ mile. The outer extremes of these banks are about 3 miles apart, and the anchorage is between—inside of them—in about 5 fathoms, the centre of the town bearing N.N.W., and Pietra Bianca S.E. $\frac{1}{4}$ E. Here westerly and south-westerly winds send in a considerable sea, but there is little risk if well moored.

Durazzo town,—ancient *Dyrrachium*,—lies partly on a slope of Mount Durazzo and partly in a pretty valley to the south of it. It is a fortified and walled town, and was the emporium of the commerce of the Romans with Greece: to this day it is the chief centre of trade in Albania.

The Kovaia, or Iscoumi, which empties itself in the south part of the bay, after traversing a very fertile plain, has its source in Lake Ocrida. Its mouth is pointed out by some storehouses and the custom-house.

LIGHT.—A *fixed* white light 47 feet above the sea, and visible in clear weather at 6 miles, is exhibited on the town mole.

DIRECTIONS.—On approaching this anchorage a look-out should be kept for a white rocky hillock, Pietra Bianca, in the bottom of the bay, as this forms a good guide for identifying the bay in the offing, and for taking up a berth between the banks. After making capes Pali and Laghi, and as soon as Pietra Bianca is seen, the latter should be brought to bear East, and a course steered for it until the western extreme, cape Durazzo, is in one with cape Pali to the northward. The spit of St^a Lucia will then have been passed, and a course may be steered for the plain between the town and Pietra Bianca, and a berth taken up according to the vessel's draught of water.

When cape Laghi is clouded, Pietra Bianca will, probably, be seen; otherwise, it would not be safe to attempt this anchorage.

The COAST.—From cape Laghi to cape Tre Porti, to the southward, there are no remarkable objects by which positions may be identified. The shore is one uninterrupted sandy beach, bordered by a vast desert plain, intersected by marshes as far as the mountains in the interior. Numerous small sand-hillocks meet the eye, and sand-banks render unapproachable this coast, which affords no shelter.

Semene and Voiuza rivers, empty themselves here. The first, which flows from Mount Tomor, falls into the sea about 23 miles southward from

* See Plan of Durazzo Bay, No. 1,590; scale, $m = 0\cdot9$ inch.

Cape Laghi, where it has formed a low dangerous jutting-out point; the second, whose source is at the foot of Mount Pindo, reaches the sea at about 8 miles north of cape Tre Porti, off which its alluvium has produced islands, and shifting sand-banks.

Cape Tre Porti, which is the northern limit of Avlona bay, is not a prominent point, but being a mixture of rocks and earthy matter, it forms some contrast with the general aspect of this low sandy part of the Albanian coast. There are some rocks off it, but they extend little farther than three-quarters of a cable.

SASENO ISLAND, which lies off the entrance of Avlona bay, is steep-sided, and 1,000 feet high; the summit is formed by two dark conical hillocks, which at a distance give it the appearance of two islands. It is uninhabited, excepting occasionally by shepherds, who find pasture for their flocks.

Between this island and cape Tre Porti, the depth is 17 fathoms at half a mile from the former, and $6\frac{1}{2}$ fathoms at a mile from the latter; the holding-ground is excellent, but the shelter seaward is good from southerly and westerly winds only.

AVLONA BAY.—This spacious bay is comprised between capes Tre Porti and Linguetta. For some distance southward of the former is a low sandy shore; farther south the coast is skirted by hills of moderate elevation. The south extreme of the bay is low, and contains a lake, in the vicinity of which the ground is marshy. The south-west side is high and almost precipitous land, which terminates in cape Linguetta. Its position near the entrance of the Adriatic, gives importance to the bay as a place for vessels to make for, if overtaken by a south-west gale on entering, or by south-easterly or easterly winds on quitting, this sea.*

Vessels visiting the bay in the summer for a short stay, generally moor opposite the custom-house near the eastern fort, in 10 to 13 fathoms, mud and weed. North-westerly winds send a heavy sea into this anchorage, and the bora is severely felt.

Vessels intending to remain for a longer period should proceed to Ducathes bay, which forms the south-east portion of Avlona bay, where the shelter is good from all winds. An indentation in the south-west side of Ducathes, called Port Ragusin, is well defended on all sides, has sufficient depth of water and capacity for a vessel of any size, and would be a convenient place for performing repairs, were it not so far removed from all resources.

The town of Avlona,—ancient *Aulon*,—is at the foot of a cultivated hill

* See Plan of Avlona Bay, No. 1,587; scale, $m = 0.6$ inch.

about 3 miles from the coast, and is defended by two forts. The hillocks south-eastward, on the crowns of which is one of the forts, are thickly planted with olive-trees. It was formerly populous, but was thinned by a severe epidemic, and now contains 5,000 inhabitants. There is little trade. Salt is the chief produce. The arms manufactured here are held in high esteem.

Water.—Two aqueducts convey water from Canina fort to the sea-side. Two small streams, the Dagliano, on which is a mill, and the Nisvora, afford facilities for watering in the south part of the bay.

DIRECTIONS.—Cape Linguetta, and Saseno, are easily recognized, especially the former, which is a continuation of the Cimara range of mountains, jutting out 9 miles in a north-westerly direction. It is nearly 3,000 feet high near the middle, which is the most elevated part of this long tongue of land, and is covered with wood; the extremity itself is low.

When making the land from the north-west quarter, a course should be steered, until Saseno is seen, for Pegola mountain, 7,764 feet high, and which is covered with perpetual snow. In passing this island and cape Tre Porti, the latter should not be closely approached, on account of the shoals off it, and the current which here sets to the northward.

The southern passage, between cape Linguetta and the island, is safe, but in proceeding thereby to the bay it should be borne in mind that the current sets through it to the north-east. However, the currents are not very rapid except in south-east winds, when it is advisable to borrow rather upon the Linguetta side. During these winds a good look-out must be kept for violent squalls from the high lands in the neighbourhood.

The COAST.—Between cape Linguetta and Port Palermo the shore is almost always inaccessible, and generally precipitous: at a short distance inland, and running parallel with it, is seen a line of mountains of primary formation. Here and there are small coves, which served as places of refuge for the pirates who formerly infested the entrance of the Adriatic. There is no shelter whatever throughout this extent, along which the current almost constantly sets north-westward. It would be dangerous to be overtaken by a gale near this shore, as the wind, in increasing, generally veers to the southward, and blows dead on to the land.

Strade Bianche are the sandy beds of a great torrent, which, descending from the mountains at a steep inclination, present the appearance, many miles off, of broad white paths, whence their name.

Mount Cica, the most elevated peak of the Cimara range, rising 6,300 feet, bears about N. 6 miles, and Mount Cicara, 5,473 feet, E.S.E., $2\frac{3}{4}$ miles from Strade Bianche; together, these form sea-marks easily recognized, and are visible in clear weather fully 25 leagues at sea.

PORT PALERMO—ancient *Panormus*— is a bay formed on the west side by a high ridge of land which projects southward for more than a mile, and slopes gradually towards its extreme; it is sheltered on the south-east side by an elevated peninsula, and is open to the south-west.*

The bay is divided into two parts by a projecting point, upon which is a triangular castle, with a few houses in the rear. The real port is on the west side, has 18 to 35 fathoms, muddy bottom, and is well defended against all but westerly winds; on the east side, called Kaka bay, there is rather less depth. The prevailing wind should be considered in the choice of one of these anchorages; the shelter is very good, but the bottom deepens so rapidly towards the entrance of the bay, that anchors often drag in the bora, which frequently blows here in the winter. Rocky bottom is found in various parts of the roadstead.

Supplies.—Beef and mutton may be readily obtained, but vessels seldom touch here except in cases of necessity; the inhabitants, who were formerly much addicted to piracy, are still, it is said, to be greatly mistrusted. It is through this port that the produce of the high lands are exported; olives, maize, gall-nuts, and wood are exchanged chiefly for arms.

There is no difficulty in distinguishing Palermo. Its position with reference to the Ionian islands, and to Merlera, and the high peninsula, on which stands Fort Bors, or Bhars, overlooking St. Demetri church, are ample indications. Near the fort is a town containing about 400 houses, and a minaret surrounded by a ruined wall: its inhabitants are mostly Turks.

The cape on the right of the entrance should not be closely approached, as rocks awash lie along its shore.

* See Plan of Port Palermo, No. 1,589; scale, $m = 2\frac{1}{2}$ inches.

CHAPTER XII.

COAST OF ALBANIA.—CORFU AND ITS ADJACENT ISLANDS.

VARIATION $10^{\circ} 45'$ West in 1861.

THE coast of Albania between ports Palermo and Parga, a straight distance of 48 miles, is at present in the Turkish pashalik of Yánina. It has a sparse population, and presents a series of barren hillocks, among which are thinly scattered patches of cultivated ground. Near the beach, about $2\frac{1}{2}$ miles from Palermo, is the small church of St. Demetri, overlooked by the ruins of Fort Bors; the shore is of bold approach, with considerable depth of water, sandy bottom, as far as the south extreme of Quaranta, or more correctly, I Santi Quaranta, bay.*

QUARANTA BAY, about 15 miles from Palermo, is well protected from all but westerly winds, to which it is quite open, and a good anchorage for vessels of any size. Large vessels anchor near the middle, in about 17 fathoms, and small craft find good shelter to the northward almost abreast of some dwellings near the Custom-house.

DIRECTIONS.—Cape Kefali, a promontory of moderate elevation, projects a mile to the westward, and is a guide to the position of Quaranta bay, from which it lies 6 miles north-westward. A course should be steered for a fort on a hill in the bottom of the bay: vessels borrowing upon the western point, in a northerly wind, should beware of a rocky bank with about 4 feet water, which lies nearly a quarter of a mile from it: small vessels drawing not more than 6 feet pass between the bank and the point, keeping close to the latter.†

PORT TRE SCOGLI lies 5 miles southward from Quaranta bay, between a small promontory on the north and Cape Scala on the south; its southern part is divided by 3 rocks, whence it derives its name. There are two anchorages; one with 10 to 12 fathoms, between the smaller two rocks, which are joined to the shore by shoals, and the largest rock; the other, to the northward, has a depth of 7 to 9 fathoms. Vessels of large draught use both, the former is preferable, being better protected from wind and sea, which, however, are never very troublesome in either.

* See Admiralty Chart of Corfu channels with adjacent coast of Albania, and 5 Plans, No. 206; scale, $m = 0.3$ inch.

† Our Corfiote pilot stated that a shoal extends from the shore just to the northward of Quaranta bay, which would oblige a vessel approaching the bay from the northward to give the land a wider berth than is shown to be required in the Admiralty Chart. Remarks by Commander Blomfield, H.M.S. *Osprey*. 1859.

BUTRINTO BAY* is separated from Tre Scogli by cape Scala, which lies at the narrowest part of Corfu channel. It is considered the best anchorage on the coast of Epirus, being about $1\frac{1}{2}$ mile wide, and completely sheltered by Corfu island. The depth in the middle is 10 to 12 fathoms, good holding-ground; the north shore should not be approached as it is being constantly rendered shoaler by deposits from Butrinto river, which has its source in the neighbouring lake. The latter is stagnant, and taints the waters in the vicinity; on its south side is the small town whence the name is derived.†

THE COAST between Butrinto and Cape Stilo, nearly opposite Corfu city is high, and the depth close to the cape is considerable. It continues elevated, and is barren and uncultivated between the latter and Sejada, a small town about 9 miles eastward, and close to a conical hill near the beach. A shoal formed by a rivulet then commences, and extending in some places 2 miles outward, terminates a little beyond the low sandy Kalama point, at which the stream which has formed it falls into the sea.

ANCHORAGES.—Cape Stilo forms three little bays with high shores, which are well protected by the island, and are used by small vessels.

About 5 miles from Stilo, Pagagnà point, a hammer-shaped peninsula, forms two small bays; the westernmost is used by vessels of light draught, which anchor in 6 fathoms with cables to the shore; the other is resorted to occasionally by vessels of large draught which anchor near the middle in 17 fathoms, taking care to keep well clear of the western shore near which are some small rocks awash. The latter anchorage is not well protected from winds eastward of south.

PORT VATTUZZA.—Vessels of any description may anchor in 9 to 12 fathoms in this bay, formed by Kalamà point 6 miles southward of Pagagnà point, and an islet joined to the shore by a reef of rocks.

The small brownish Prasudi rock lies off the south extreme of the bay; there is a passage which may be taken, if necessary, between it and the islet. The shoal Kalamà point must be avoided on entering.

GOMENIZZA BAY is limited, westward, by the islet above-mentioned. It is entirely protected seaward by a tongue of high land which juts out to the westward, and is terminated by Aionisi rock: the low north shore which has been formed by Kalamà rivulet, projects in a narrow point southward, towards this tongue, and between them is the entrance, which

* See Plan of Butrinto Bay; scale, $m = 2$ inches, on Chart of Corfu channel, No. 206.

† Butrinto, Kataito, and Livitazza (at the mouth of the river Kalamà), are the best grounds for snipe, woodcock and wildfowl of all kinds; and Ptelia and Pagagnà for deer and wild boar; which latter are also found on the Sybota (i.e. Swine isles) frequently called Murto.

has a depth of 5 to $6\frac{1}{2}$ fathoms, and is half a mile wide. The anchorage in 10 to 14 fathoms in the south-east part, where lies a small village, is well protected from all winds. Mavronoros, remarkable for its round form and a brownish looking hollow on the south side near the summit points out Gomenizza bay, the shores of which have a barren aspect. .

PLATARIA BAY, immediately to the southward of Gomenizza, is protected from all but westerly winds, to which it is much exposed ; a long slender point, at the extremity of which is the small Garuna or Surmati point, completely shelters it on the south side ; the depth of water is 38 fathoms, sandy bottom in the western part, and 27 fathoms in the middle. The adjoining land is steep and rocky, and, excepting a small village on the beach, uninhabited.

MURTO BAY is bounded on the north by the above-mentioned long point, and on the south by the Murto and Sybota rocks. Vessels of large draught anchor near the middle of the bay in 32 fathoms, mud, with Murto village bearing S.E. by S.: small vessels bring up between the point and the rocks. There is no passage between the latter, nor between them and the shore. Water may be obtained from a copious spring near the village, which, with a Custom-house, is close to the beach. Sheep and firewood are easily procured. The coast between Murto bay and Parga is uninhabited, precipitous, of bold approach, and without anchorage.

CORFU is the most important of the Ionian islands, and may be considered the key of the Adriatic sea. It is about 35 miles long from N.W. to S.E. ; the northern portion is 16 miles wide from E. to W. ; to the south of Ipso the island suddenly contracts to less than 6 miles in width, to the south of the city of Corfu to 4 miles, and farther south at the head of Lefkhimo bay to less than 2 miles ; its area may be 200 square miles, geographic. It is mountainous ; the most elevated part, Mt. S. Salvatore, (Istone of the ancients, Pantokrator of the Greeks,) rises with two conical peaks to the height of 3,117 feet above the sea ; farther south are Mt. S. Giorgio, 1,326 feet, and Mt. Déka, 1,968 feet. The island contains about 65,000 inhabitants ; the chief exports are salt, oil, and olives ; it produces excellent fruit, especially oranges, citrons, grapes, honey ; also wax and various vegetables, but only sufficient corn and wine to supply the inhabitants for a part of the year. One stream alone, the Potamo, deserves the name of river.*

The East COAST, which with the shore of Epirus forms Corfu channel, begins on the north at St^a Katarina point which has a chapel on its extremity.

* The name Corfu is an Italian corruption of *κόρυφω*, the Byzantine name for the island, derived from the two peaks, or *κόρυφαί*, on which the citadel is now built. Its ancient name was Corcyra.

PRAU BAY, south-eastward of St^a Katarina point, is a very convenient anchorage for vessels detained by south-easterly and southerly winds, from which, and from those between north-west and south-west there is good shelter near the middle, at about a mile from the shore, in 24 to 27 fathoms, good holding-ground. The south-east side must not be closely approached as shoal water extends about half a mile from it. Vessels beating in must keep well clear of Cape Apracci on the west, and of Kassopo point on the east side; rocks and shoal water bordering them at a distance of $3\frac{1}{4}$ cables. It is better in north-easterly winds, which are severely felt here, to anchor in Quaranta bay. On either side of Kassopo point is a cove in which boats take shelter. Water is the only refreshment to be obtained in the bay.

GALEAZZE BAY, is small and nearly land-locked; it is used by small vessels which anchor well clear of the shore at the bottom of the bay, in 12 to 16 fathoms, sand. The coast now approaches within $1\frac{1}{4}$ miles of the shore of Epirus, thus forming the narrowest part of the north channel. At half a mile off shore, abreast of the village of S. Stefano, is a rock named Serpa, which must be carefully avoided. Thence to the southward are port Karagol, Ipso, and other coves formed by the projecting spurs of mount S. Salvatore, the summits of which are here only distant $1\frac{1}{2}$ miles from the shore.

PORT GOVINO lies at the bottom of a small bay, 4 miles north-westward of the city Corfu; it is bordered by hillocks, and well sheltered by a peninsula, which stretching out from the south-east point about three-quarters of a mile in a northerly direction, terminates in a steep hill. The anchoring-ground, which has a depth of about 4 fathoms, has an area of 6 cables in length by one in width. The adjoining land is cultivated. Govino village is on the south, and the remains of a Venetian arsenal are on the west side of the bay.

On approaching this small port a course should be steered for Govino point: the extremity of the peninsula should be passed at a distance of more than 2 cables; and when inside, the vessel's head directed to the ruins of the arsenal, abreast of which is the anchorage, at about $1\frac{1}{4}$ cable from the shore. If desirable, the anchor may be dropped about 3 cables nearer the village, by taking a narrow channel of 16 feet depth.

CORFU ROAD extends in a N.W. and S.E. direction along the north face of the town from Lazzaretto islet to the Citadel point, and is sheltered from the north-east by Vido and its outlying shoals; it affords anchorage, nearly 3 miles long by one mile wide, in depths from 10 to 18 fathoms, mud and clay. Ships of war usually anchor about mid-channel; smaller

vessels and steamers near the Health Office, in about 5 fathoms at 2 cables from the shore.*

Lazzaretto islet, upon which is the quarantine establishment, is bold around to the distance of little more than a quarter of a cable. Vido islet is 7 cables long, and is bold to on three sides; to the north-west the Kabogero or Kaloyero isle and shoal lie half a mile off, with deep water between, and to the north Kondolonisi islet and reef reach off 2 cables. Both shores should be given a good berth in entering or leaving by the north channel. Kondolonisi, when seen from the south-eastward, has the appearance of a vessel under sail. Vido is one extensive fortification; the landing place is on the south-west side, but no one can land without permission.

CORFU TOWN is picturesquely placed on a promontory projecting to the eastward, and is washed on three sides by the sea. Still farther east rises the citadel, built on a huge insulated rock, with its summit split into two peaks, one crowned by a fortress, the other by a lighthouse and telegraph station, 240 feet above the sea. The town is surrounded by fortifications, the Venetian fort of *La fortezza nuova*, or as commonly called *Fort neuf*, forming the north-western extreme. On the north face of the town is the *Uffizio di Sanità* or Health Office, with which all vessels must communicate before landing, and immediately adjoining the usual landing place (extremely inconvenient in a strong northerly wind) is the post office. On the east face of the town is the Government House and a noble esplanade, laid out with walks and avenues of trees, and commanding a magnificent view across the channel, near 10 miles wide, to the opposite coast of Albania.

In the ditch on the west face of the citadel is a landing place, whence a flight of steps leads up to the esplanade; on the north face is a camber, in which small vessels lie in 6 feet water; a gate at its S.E. angle leads up into the citadel. Corfu affords resources of all kinds, including ship-building yards; provisions are abundant, and a copious supply of water has been brought in pipes from a source above Benizze, a distance of 7 miles; it may be procured near the Health Office on the north face of the town, or at Kardakio bay to the south. Ships of war are supplied with water from a pipe leading down to the ditch of the citadel in winter; in summer if the water gets scarce it is necessary to go across to Butrinto on the main. An admirable *Strada Marina* has been constructed round the bay of Kastrades, and forms a much frequented public drive and promenade. The town, including the suburbs of Manducchio to the west,

* See Plan of Corfu Road with View, No. 1,450; scale, $m = 2.8$ inches.

and Kastrades, or Garitza, to the south, contains 20,000 inhabitants, of which 5,000 are Jews.

LIGHT.—A *fixed* white light is shown on the Citadel, at an elevation of 240 feet above the level of the sea: it is visible in clear weather at the distance of 12 miles, and may be seen from the northern, and shortly after entering the southern, passage.

DIRECTIONS.—The passages between Lazzaretto, St. Vido, and Kondolonisi may be taken according to the convenience of vessels in approaching from northward or from southward. Care is required in light airs to avoid being set upon Kondolonisi by the current.

Kastrades bay, which lies under the east side of the city, is quite exposed to the eastward, and having little depth of water is not used as an anchorage. Southward of Kastrades is the entrance to the Kalikhiopulo fishery, a spacious lake, anciently the port of Chrisopolis, remains of which are in the vicinity. Off the entrance is Zorzi, or Ulysses rock, the largest of several small rocks, and which appears, by the ruins of a wall, to have been once united to the island. Between Zorzi rock and Allonaki, or Lefkhimo point, is a low sandy shore, without hidden dangers; vessels anchor at all parts of it.

BENIZZE ANCHORAGE is opposite the small village of this name, in 10 to 13 fathoms, at three-quarters of a mile from the shore. The north extreme of the village should be brought in one with the summit of mount Santi Déka (*Ἅγιοι Δέκα*, or Ten Saints), bearing W. $\frac{3}{4}$ N. Off Messongi, vessels anchor at about 2 miles from the shore, in 24 fathoms.

LEFKHIMO ANCHORAGE is in 17 fathoms, mud, the light vessel bearing E.N.E., and the pier and white houses on the beach S.E. In approaching this anchorage, to avoid Lefkhimo spit, do not bring the light vessel to the eastward of S.E. by E. until the white houses bear South.*

A LIGHT VESSEL is anchored in 5 fathoms, at rather more than a cable from the N.E. extreme of the low Allonaki, or Lefkhimo point, and at an elevation of 20 feet above the sea, shows a *fixed* white light, which may be visible in clear weather at the distance of 6 miles. By keeping the light N.W. by N., the shoal which extends from Saline point, and on the north-eastern part of which the vessel is moored, will be avoided.

CAPE BIANCO, the south extreme of Corfu island, is rather elevated, of whitish aspect, and when seen at a distance, presents the appearance of a vessel under sail. At a nearer approach it somewhat resembles Beachy head on the south coast of England: a shoal runs off from it nearly

* Remarks by Mr. James Kiddle, Master, H.M.S. Algiers, May 1861.

2 miles south-eastward to the depth of 5 fathoms, and extends along the south-east coast as far as Allonaki point.*

A *black* buoy, in 10 fathoms, marks the southern extremity of this shoal; and a *red* buoy, in about 9 fathoms, the north-east extreme, which will be cleared by keeping the west end of the citadel of Corfu in line with Salvatore pap N.N.W. (See View in Chart, No. 206.)

NORTH COAST.—Between St^a Katarina point and Cape Drasti, the coast of Corfu is generally low and sandy, and the soundings increase very gradually to about a mile from the shore, at which distance the depth is little more than 8 fathoms. The best anchorage in south-easterly and south-westerly winds is 2 miles eastward from Cape Drasti, opposite the village of Sidari, near which is the mouth of Tiflo river. Here, with Sidari point bearing about East, are depths of $2\frac{1}{2}$ to $8\frac{1}{2}$ fathoms, at half a mile from the shore. The land in the vicinity of Cape Drasti is hilly, and well wooded; some villages may be seen inland.

WEST COAST.—Cape Kefali is a small peninsula, precipitous on the south side, and bordered by rocks and shoals which extend some distance northward along the shore, and a sunken rock lies at nearly one mile N. by W. from it. Between Kefali and Cape Bianco there is no well sheltered anchoring-ground, and although there is generally considerable depth there are rocks in some parts about a mile off shore.

DIAPLO Islet, 2 miles N.W. of cape Kefali, is surrounded by rocks, which on the south-west side extend to the distance of 2 cables. In the narrow passage between it and Corfu, which is very shallow in some parts and divided by a rocky bank with less than 5 fathoms on it (at half a mile off the islet), the current is very rapid.

PORT TIMONE is a small anchorage, in $3\frac{1}{2}$ fathoms, to the northward of Arilla point, a high narrow tongue of land, jutting out about a mile in a S.S.W. direction, 3 miles south from Kefali: it is protected on the north-west by Kravia rock. Vessels may anchor in $8\frac{1}{2}$ to 17 fathoms between Kravia and the shore, and be secure from all but southerly winds; they should pass to the southward of the rock, as a shoal extends nearly 4 cables from it.

YLIAPADES BAY, between St. Angelo and Plakka points, contains the small ports Alipa and St. Nicolò, in which coasting vessels find shelter.†

Between Plakka point and Cape Bianco the shore is generally inaccessible. The soundings are in most parts deep, but there are some dan-

* See Plan of Cape Bianco Bank; scale $m = 1\frac{1}{2}$ inch, on Chart No. 206.

† See Plan of ports Alipa and S. Nicolò, in Yliapades Bay; scale, $m = 3\cdot7$ inches, on Chart No. 206.

gerous rocks and shoals at about a mile from the shore, as the Gordi rocks Pendunisi, the Braganotica shoal, the Lagudia rocks, and the 5 feet reef. A few small anchorages, called ports, are visited by coasting boats.

The Lagudia rocks form a rocky shoal one mile long, at $1\frac{1}{2}$ miles off shore ; abreast of them is Korisia, a fishery lake, accessible to small boats only, and the village of Maralia.

MERLERA is the most northern of a group of four islets which lie off the N.W. coast of Corfu. It is about $1\frac{1}{2}$ miles in diameter, and of moderate elevation, say about 300 feet, the north-east end being the higher. The bottom around, to the distance of 2 cables, is sandy : the western shore is steep, and inaccessible to boats. The south side of Merlera forms a bay, abreast of which there is shelter from northerly, but none from southerly winds : the water is shoal to some distance from the two points of the bay, between which there is a depth of 6 to $8\frac{1}{2}$ fathoms, sandy bottom.

FANO, at a distance, presents the appearance of a single mountain covered with pine trees. It is 2 miles in diameter and the highest of the islets north of Corfu, rising to 1,214 feet above the sea : the height diminishes gradually from the south-west side to its narrow, elongated north extreme ; the western side is rather low ; the other parts are generally inaccessible. A rocky shoal extends nearly $3\frac{1}{2}$ cables from Genovese point, the north-east extreme of the island. Aulaki or Port Nord is an open bay on the north coast : vessels of any draught may anchor abreast of it, under shelter from winds between south-east and south-west, but should be prepared for a start before the approach of those from north and north-east, to which they would be exposed with indifferent holding-ground. Abreast of Port Sud, on the south, vessels may, in fine weather, anchor in 7 to 12 fathoms ; but southerly winds send in a heavy sea, and violent squalls reach it from the land northward. The depth in the middle is little more than one fathom, and there are rocky banks off the shores. Vessels of light draught enter by a narrow passage between its western point and a rocky bank which lies off it, or between another bank and the eastern point which runs out shoal to nearly $1\frac{1}{2}$ cable. Fano and Merlera together contain above 1,800 inhabitants. Fano abounds in quail. It is the ancient Othonus.

SAMOTRAKI, the lowest of the islets north of Corfu, is uninhabited. Excepting the north-east shore, which is clean, it is bordered by rocky shoals, some of which extend more than 3 miles from it. In passing between it and Fano, Samotraki should not be approached within at least 2 miles. In passing between it and Corfu, Diaplo islet should be left to the eastward.

Care must be taken to avoid Ulisse or Ship Rock, one of the two so called ; it lies about a mile W. by S. from Diaplo ; also a still smaller

rock three-quarters of a mile south from the Ship, named the South rock, and a 2-fathom rock at one mile north of the Ship rock.

PAXO ISLET, at 8 miles to the S.E. of the south end of Corfu, consists of a number of hills covered with olive trees, and in clear weather can be seen at the distance of 30 miles; it has a reddish aspect, and on the south side are some conspicuous white spots. The water is of great depth on the west and south-west sides, which are precipitous: the east and north-east shores are less steep, and here are the small ports Laka, Longone, Gayo, and Spuzzo. The north-west end is bordered by rocks and shoals which extend in its direction about three-quarters of a mile: two rocks, one of which is close to the shore, lie off the south-east extreme. Population about 5,000 inhabitants. Port Laka, at the north end, has only a depth of $1\frac{3}{4}$ to 2 fathoms, and is frequented by coasters. A village is at the bottom of the bay.*

LIGHT.—A *fixed* white light is on Laka point, a steep rock at the north end of Paxo; it is 369 feet above the sea, and can be seen in clear weather at the distance of 22 miles, excepting between N. by E. and W. by N., from the south-eastward, between which bearings it is masked by the island. The lighthouse is white.

MARMORE REEF is a rock with less than one fathom on it, and surrounded by a depth of about 15 fathoms, lying N. by E. from the light and about one-third of a mile from the north-west point of the island.

PORT GAYO is formed by the south-east coast of Paxo, and three rocky islets: the easternmost of these, Zuane, is connected by a reef with the centre one, Madonna, on which is a light-house: upon the westernmost and largest, St. Nicolò, is a fort. This small port is very well sheltered, but has not sufficient space for vessels of large tonnage; the anchorage in 4 to 7 fathoms, is between Paxo and St. Nicolò, to which it is customary to lay out cables. A village lies along the shore.

The best anchorage off Port Gayo is with the windmill on the top of Paxo island, in one with the light-house on Madonna islet, and the buoy of the shoal in one with the south extreme of Paxo. This is about $1\frac{3}{4}$ cable from the buoy, and in 9 fathoms, mud.

Water may be obtained with facility.

MADONNA SHOAL lies $1\frac{3}{4}$ mile eastward from Port Gayo, and extends about 1 mile in a direction parallel with the island, between which and it there is a deep channel. A *striped* buoy on it is in 3 fathoms; a ship's length south-eastward of this, the shoal frequently uncovers.

* See Plans of Ports Laka and Gayo; scale, $m = 3\frac{1}{2}$ inches, on Chart No. 206.

LIGHT.—There is a *fixed* white light on Madonna islet ; it is 107 feet above the sea, and may be seen in clear weather at the distance of 10 miles. The light-house is a white round tower.

DIRECTIONS.—There are three passages to Port Gayo ; one to the northward of Zuane rock and Madonna islet ; another between it and St. Nicolò ; and a third to the southward of the last. The first is the best, and has a depth of 8 fathoms.

Caution is required in passing between Madonna shoal and Paxo ; although parts of the former are awash, the depth is 3 to 6 fathoms close to it, and a current sometimes sets towards it.

* “To clear Madonna shoal, the ship passing to the eastward, the west peak of St. Salvatore should be kept open of Allonaki, or Lefkhimo point,—or what remains of it in sight,—or, the west peak on Cape Nicolò in one with the high peak of Mavronoros, over Gomenizza bay. To clear it to the westward, the east peak of St. Salvatore should be kept in one with, or open of, Allonaki point.”

ANTIPAXO has a flat appearance when seen from afar. Its south-east end, which is uninhabited, is bordered by high rocks and shoals which extend about three-quarters of a mile from it in a southerly direction, and are terminated by Plakka islet, close to which the depth is 5 to 10 fathoms. Excepting a cove on the west side to which small vessels resort, this islet affords no place of shelter.

The channel between Antipaxo and Paxo, about one mile wide, is very deep, and both shores are of a bold approach ; strong eddies are formed in it by the current. In passing out of the channel to the northward, a good look-out should be kept for Madonna reef.

CORFU CHANNEL.—The breadth of the channel between Corfu and the coast of Albania varies between $1\frac{1}{2}$ and 12 miles ; its length is 35 miles. Vessels find it convenient to anchor in it during contrary winds when entering or quitting the Adriatic. Anchorage may be found almost everywhere between St^a Katarina point and Cape Bianco in less, generally, than 43 fathoms clay : the coast of Albania should be preferred.†

TIGNOSO LIGHT is a *fixed* white light on the summit of Tignoso rock, which lies about S. by W. $\frac{3}{4}$ W. three-quarters of a mile from the north-east end of Corfu island. It is 100 feet above the sea, and should be visible 14 miles if kept in good order. It is an useful light to guide vessels clear of Barchetta, and Serpa rocks.

* Remarks by Mr. George Biddlecombe, Master H.M.S. Talbot, 1839.

† See Chart of Corfu Channels, No. 206 ; scale, $m = 0.3$ inch.

The Corfu Citadel light ; the floating-light off Allonaki or Lefkhimo point ; and the lights on Laka point and Madonna islet off Paxo, have been described at pages 227 and 230.

DIRECTIONS.—North Channel by Day.—Vessels approaching from north-westward, or from the Adriatic, with northerly or westerly winds, should make Fano, and pass northward of it and of Merlera. Arriving from the westward, and being obliged to pass southward of Fano, a wide berth should be given to Samotraki, and the passage taken between Fano and Merlera ; or when clear of Samotraki, the south extreme of Merlera may be steered for, and thence a course shaped for the north-east point of Corfu.

On entering the channel, which is narrow for a sailing vessel, excepting with a fair wind, the small Barchetta rock will be seen : it has the appearance of a boat, and is about half a mile eastward from Tignoso ; between them is a safe passage with 21 fathoms in the middle : a small dangerous rocky bank, with little more than 1 fathom on it, lies about 1 cable N. by W. from the Barchetta, and between them is a depth of 7 fathoms. Tignoso should be steered for, and the passage taken between it and Corfu ; when past Tignoso, a course about S.S.E. $\frac{1}{2}$ E. should be steered till its lighthouse bears N. by W. $\frac{1}{4}$ W., or till the white round tower of St. Stefano, which is on a high hill, bears W. by N. $\frac{1}{2}$ N. Serpa rock will then have been cleared, and a S.S.W. course will carry the vessel rather less than 3 cables eastward from St. Vido, and to the anchorage. Serpa rock is a small reef, parts of which are dry at times : it is $1\frac{1}{2}$ mile south from Tignoso, and about half-a-mile from the north-east extreme of Corfu. There is a passage with a depth of 4 and 5 fathoms between it and the shore. Caution is required to avoid this reef ; there is deep water close to it.

With variable or contrary winds it is advisable to pass north-eastward of Tignoso, and to beat up along the coast of Albania until Serpa rock has been passed ; the shoal off Barchetta will be avoided by tacking northward of the line joining the south extreme of Merlera and the north point of Corfu.

North Channel by Night.—When proceeding by night through the North channel to the anchorage, Tignoso light should be steered for as soon as seen, and left about $1\frac{1}{4}$ cable, at the least, to the eastward in passing between it and Corfu. When abreast of the light, bearing about N.E. by E., a course between S.E. and S.E. by E. should be steered for about $1\frac{1}{2}$ mile to bring it to bear N.N.W. $\frac{1}{2}$ W., and by keeping it on that bearing Serpa rock, which lies just to the southward of the north-east point of Corfu, will be cleared.

If Corfu citadel light should then be seen, the vessel's head should be directed to it ; otherwise a S.S.W. course should be steered towards the east end of Vido, which should be left a quarter of a mile westward, and so to the anchorage.

With variable or contrary winds, it would be preferable to pass northward of Tignoso light and its rocks ; in this case, to avoid Barchetta which is not easily perceived at night, the light should never be brought to bear westward of W. by S. $\frac{1}{2}$ S. until arrival at the distance of at least one mile eastward of it, or until Corfu citadel light bears S.S.W. When Tignoso light bears a little southward of West, the vessel will be on the line joining it and Barchetta, which with its reef will have been cleared when the light bears W. by N. $\frac{3}{4}$ N. In tacking, the clear Albanian coast should be preferred, and the Corfu side not approached much beyond the line of mid-channel until southward of Serpa rock.

The above instructions should, of course, be reversed, in quitting the channel by the northern passage.

South Channel by Day.—Approaching from westward, and with a fair wind for the southern passage, Paxo should be sighted, and a course steered to pass between it and Cape Bianco, giving the latter a berth of about 3 miles, or not bringing Laka point to the southward of S.S.W. till Cape Bianco bears West, to clear the south extreme of its shoal on which is the *black* buoy, and passing eastward of the *red* buoy marking the north-east extreme, in at least 10 fathoms ; thence a N. by W. $\frac{3}{4}$ W. course will carry a vessel about $1\frac{1}{2}$ mile eastward of Allonaki light vessel, and to the anchorage.

Approaching from the southward, or from south-eastward, the passage between Paxo and the mainland may be taken, passing by preference on the east side of Madonna reef, which will have been cleared when Madonna island lighthouse bears West. If the passage between Paxo and the reef be taken, Antipaxo should be closed, and when Madonna lighthouse is seen a course should be steered to bring it to bear N.W. $\frac{3}{4}$ N., which will carry the vessel half a mile from it ; and when it bears W. $\frac{1}{2}$ S. the reef will have been cleared ; after which a Northerly course should be steered until past the *red* buoy off Cape Bianco. When the extreme of this cape bears W. by N., and Murto rocks E.N.E., all the dangers off it will have been passed, and a N. by W. $\frac{3}{4}$ W. course, as before, will take the vessel to the anchorage.

In clear weather, Mount St. Salvatore, on the north-east part of Corfu, is a good mark for clearing the bank off Allonaki point, on the way to the anchorage ; it should be kept a little open to the eastward of the easternmost hillock of Cape Krido, of Corfu, bearing N.N.W. $\frac{1}{4}$ W.

In working through the channel from the southward, the Albanian coast may be closely approached, excepting northward of the islets forming Port Vattuzza, where a distance from it of at least 3 miles should be preserved to avoid the shoals off Kalamà point and its vicinity.

If the land should be made from the southward in a gale of wind from this quarter, and it should be found impracticable to fetch sufficiently to windward of the dangers off Cape Bianco, it would be necessary to bear up for Fano, avoiding the shoals westward of Samotraki, and then haul to the wind to close St^a Katarina point, leaving Fano and Merlera on the starboard hand. Eastward of St^a Katarina point, the vessel could await at anchor the termination of the gale.

South Channel by Night.—When proceeding from the southward, with southerly or south-westerly winds, a good berth should be given to Antipaxo if it be the intention to pass between Madonna shoal and the light on Madonna islet. When seen, the light should be brought to bear from N.N.W. $\frac{3}{4}$ W. to N.W. $\frac{3}{4}$ N. and the vessel steered on this course to carry her clear, to the westward, of Madonna shoal. The light should be left half a mile westward and when bearing W. $\frac{1}{2}$ S., a north course should be steered for 9 miles to bring Laka light on the north-end of Paxo S.S.W., when the *red* buoy off Cape Bianco will be about one mile to the westward. When northward of the buoy, a N.N.W. course should be steered, and Lefkhimo floating light will soon be seen, and should never be brought to bear northward of N.W. by N. Passing half a mile eastward from the floating light, Corfu citadel light will be seen, and should be brought to bear N.N.W., which should then be steered as a course to pass half a mile from Citadel point, on rounding it to the anchorage.

When proceeding from the southward it will be generally advisable to pass to the eastward of Madonna shoal, keeping in mid-channel, or on the Albanian shore, beyond half a mile from which it is at this part safe.

Proceeding to the southern channel from westward, the passage between Paxo and Cape Bianco is taken. When Laka light is seen, it should be kept a little on the starboard bow in order to pass about $3\frac{1}{2}$ miles northward from it. When it has been brought to bear S. by W. a N.E. $\frac{1}{2}$ E. course should be steered for $3\frac{1}{2}$ miles, when Madonna light will bear S. $\frac{1}{2}$ W. The course will then be N. $\frac{1}{2}$ E. to pass the *red* buoy, and when this bears W. by N. the course will be N.N.W., and as above.

When working through by night, a vessel while well to the southward of Lefkhimo light may stand over to the westward till she brings it to bear N.N.W. $\frac{1}{4}$ W., but on arrival at one mile southward of the light she should not bring it to the northward of N.W. in order to keep clear of the north-east edge of the bank off Lefkhimo, or Allonaki, point.

The Albanian coast is of sufficiently bold approach as long as the vessel is southward of Lefkhimo light, but after arrival abreast of the latter this shore should not be approached within at least 2 miles, to avoid nearing the Bacchante flat, and the Corfu side which is safe northward of the light, should be preferred.

WINDS.—South-easterly and south-westerly winds, accompanied by cloudy weather and heavy rains, are prevalent in Corfu channel during the winter; and northerly and north-westerly winds sometimes blow with violence, but do not last long. In the summer season the breezes are ordinarily light.

CURRENTS.—The currents are rapid, especially between Cape Scala and Port St. Stefano; their general direction is north, but there is ordinarily a surface current depending upon the force and direction of the wind; in strong winds it attains a speed of between $1\frac{1}{2}$ and 2 miles an hour.

TABLE OF POSITIONS.*

Place.	Particular Spot.	Latitude, North.	Longitude, East.	Variation, West, in 1861.
WEST COAST.				
Cape St ^a . Maria di Leuca	Church - - -	39 47 54	18 22 49	
Cape Otranto - - -	Telegraph - - -	40 8 46	18 30 10	11 15
Brindisi - - -	Castello di Mare - - -	40 39 27	17 58 45	
Cape Gallo - - -	Torre di Penne - - -	40 41 11	17 56 52	
Villanova - - -	Castle - - -	40 47 36	17 35 49	
Monopoli - - -	Telegraph - - -	40 57 19	17 18 43	
Mola - - -	Telegraph - - -	41 3 53	17 6 07	
Bari - - -	Belfry - - -	41 7 52	16 52 47	
Molfetta - - -	Belfry - - -	41 12 32	16 36 30	12 0
Bisceglia - - -	Torre Maggiore - - -	41 14 34	16 30 55	
Trani - - -	Telegraph - - -	41 17 05	16 25 30	
Barletta - - -	Telegraph - - -	41 19 26	16 17 55	
Manfredonia - - -	Telegraph - - -	41 37 53	15 55 25	
Varano - - -	Tower - - -	41 55 05	15 48 25	
Campomarino - - -	Belfry - - -	41 57 39	15 2 43	
Vasto - - -	Belfry - - -	42 6 50	14 43 05	
Pelagosa island - - -	Signal, west point - - -	42 23 44	16 15 57	12 5
Pianosa isle - - -	Signal, east end - - -	42 13 40	15 45 17	
Tremiti, St. Nicola - - -	Telegraph - - -	42 7 30	15 38 58	
Termoli - - -	Telegraph - - -	42 0 25	15 0 25	
Penna point - - -	Telegraph - - -	42 10 35	14 43 26	
Ortona - - -	Belfry - - -	42 21 27	14 24 33	
Pescaro - - -	Tower - - -	42 27 0	14 14 0	12 50
Castellamare - - -	Telegraph - - -	42 28 54	14 11 39	
Tronto river - - -	Torre nuova - - -	42 54 22	13 55 0	
Fermo - - -	Cathedral - - -	43 9 54	13 43 45	
Civitanova - - -	Telegraph - - -	43 18 19	13 44 24	
Loreto - - -	Cathedral - - -	43 26 40	13 36 56	
Conero mount - - -	Telegraph - - -	43 33 19	13 36 39	
Ancona - - -	Mole head light - - -	43 37 42	13 30 20	13 30
Sinigaglia - - -	Cathedral - - -	43 43 02	13 13 05	
Fano - - -	Light - - -	43 51 16	13 1 05	
Pesaro - - -	Light - - -	43 55 42	12 54 33	
Rimini - - -	Casa Garimpi - - -	44 3 48	12 34 0	
Cervia - - -	Città tower - - -	44 15 49	12 21 01	
Ravenna - - -	Città tower - - -	44 25 16	12 12 05	
Po di Maestra - - -	Battery - - -	44 59 30	12 26 12	
Port Chioggia - - -	Cathedral - - -	45 12 56	12 16 43	
Venice - - -	San Marco - - -	45 25 53	12 20 25	14 00
Caorle - - -	Belfry - - -	45 35 45	12 53 24	
Grado - - -	Church - - -	45 40 18	13 23 06	
Aquileia - - -	Belfry - - -	45 45 57	13 22 24	
EAST COAST.				
Trieste - - -	Castle clock - - -	45 33 37	13 46 21	13 28
Capo d'Istria - - -	San Lazzaro belfry - - -	45 32 42	13 43 46	
Port Pirano - - -	San Giorgio belfry - - -	45 31 35	13 34 07	
Omago - - -	Omago church - - -	45 23 53	13 31 04	
Cittanova - - -	Cathedral - - -	45 18 51	13 33 29	
Parenzo - - -	San Mauro - - -	45 13 37	13 35 34	13 40
Rovigno - - -	Rovigno steeple - - -	45 4 56	13 37 51	
Pola - - -	San Francesco belfry - - -	44 52 16	13 50 33	13 18

* These Positions are taken from the Austrian Surveys, which place the Cathedral of San Marco at Venice in long. 12° 20' 25." The *Connaissance des Temps* for 1862, gives 12° 20' 15. The *Berliner Jahrbuch* for 1852 (deduced from the position of the Marine Observatory), 12° 20' 12" East of Greenwich.

TABLE OF POSITIONS.

Place.	Particular Spot.	Latitude, North.	Longitude, East.	Variation, West, in 1861.
		° ' "	° ' "	° ' "
Cape Promontore	Mount Gradina	44 48 47	13 54 28	
Maggiore mount-	Signal	45 17 11	14 12 04	
Albona	Church	45 5 06	14 7 25	
Fianona	Belfry	45 8 13	14 10 42	
Fiume	Clock tower	45 19 39	14 26 30	13 10
Porto Re	Castel Nuovo	45 16 40	14 33 58	
Veglia island	Mount Triscavaz	45 0 30	14 40 30	
Cherso	Cathedral	44 57 44	14 23 59	
Arbe	Cathedral belfry	44 45 21	14 45 38	
Carlopagio	Mole	44 31 41	15 04 26	
Pago island	Mount San Vito, chapel	44 28 40	14 59 39	
Unie island	Church	44 38 19	14 14 36	
Lossini island	Mount D'Osero	44 40 22	14 21 39	
"	Mount Calvario	44 30 45	14 29 47	
Sansego island	Mount Garbe	44 30 55	14 08 02	
Lossin piccolo	Belfry	44 32 01	14 27 51	13 2
Isto island	Mount Guardia	44 16 44	14 46 13	
Premuda island	Summit signal	44 20 12	14 36 43	
Melada island	Church	44 12 48	14 52 32	
Nona	Cathedral	44 14 36	15 10 58	
Lunga I. Port Tajer	Tajer rock	43 51 58	15 11 27	
Punta Dura island	Mount San Giorgio	44 18 10	15 03 07	
Zara	San Simone steeple	44 06 51	15 13 42	13 6
Zara Vecchia	Steeple	43 56 19	15 26 27	
Sebenico	Belfry	43 44 14	15 53 22	
Borac mount	Signal	43 25 53	16 43 52	
Spalatro	Cathedral	43 30 22	16 26 27	12 30
Macarsca	Belfry	43 17 32	17 0 46	
Brazza island	Mount San Vito, signal	43 16 43	16 27 12	
"	Milna church	43 19 29	16 06 51	
Punta di Kleck	Extreme	42 55 59	17 33 10	
Lesina	Mount San Nicolo chapel	43 08 34	16 35 54	12 7
"	Fort Imperial	43 10 45	16 26 58	
St. Andrea islet	Summit	43 01 40	15 45 24	
Pomo islet	Summit	43 05 27	15 27 34	
Lissa	Mount Hum, signal	43 01 43	16 06 48	11 57
Lagosta island	Mount San Giorgio, chapel	42 45 01	16 51 39	11 50
Busi island	Summit, signal	42 57 42	16 0 55	
Cazza island	Summit, signal	42 46 02	16 30 48	
Curzola island	San Biagio fort	42 57 25	17 07 53	11 50
Meleda island	Mount Plagnack, Grui point	42 42 16	17 43 04	
Port Palazzo	Ruined palace	42 47 06	17 22 44	
Ragusa	Fort on the mole	42 38 18	18 06 48	
Cattaro	Sanità	42 25 26	18 46 10	
Budua	San Nicolo church	42 16 33	18 50 21	
Punta d'ostro	Extreme, signal	42 23 28	18 31 58	
Aktivari	South point	42 02 17	19 06 19	11 0
Dulcigno	Mole	41 53 50	19 10 34	
Durazzo	Mole	41 17 32	19 26 29	10 45
Avlona	Dogana or Custom-house	40 27 15	19 26 14	
Saseno island		40 29 10	19 14 06	
Palermo	Fort	40 02 55	19 48 04	
Corfu	Lighthouse	39 37 39	19 56 22	10 30
"	Landing place in ditch	39 37 48	19 56 10	
" Vido	Landing cove	39 38 40	19 56 22	
Fano island	Summit	39 50 48	19 23 58	

INDEX.

	Page		Page
Abate, Sacca dell' - - -	80	Baseleghe port - - -	95
Abatuta rock - - -	145	Benizze anchorage - - -	227
Abruzzo coast - - -	40	Bassania light - - -	105
Adercio rocks near Ortona - -	63	Berna port - - -	189
Adige river - - -	84	Berguglie port - - -	135
Adriatic, making the land at entrance	25	Bescanuova bay - - -	130
—— quitting the - - -	39	Bianche point, light - - -	144
'Agioi Déka, Mt., Corfu - -	227	Bianco cape, and shoal off Corfu -	227
Albanassi rock - - -	213	Bice island - - -	155
Albanian coast - - -	27, 222	Biezzi port in Medolino gulf - -	115
Alimini bay - - -	44	Biferno river - - -	62
Allonaki - - -	226, 233	Bisceglia port - - -	52
Almissa port, road - - -	169	Bobroviscia bay - - -	171
Altanea port - - -	93	Boiana river - - -	216
Ancona, to Venice from - - -	38	Bora or N.E. wind - - -	7, 9
—— port, light, road - - -	70, 72	Bora port - - -	110
Anfora port, river - - -	97	Bossiglina bay - - -	163
Antipaxo island - - -	231	Brazza island - - -	170
Antivari bay - - -	215	—— channel - - -	172
Arbe island, port - - -	131	Breno bay - - -	203
—— south-west anchorages -	133	Brenta river - - -	84
Arione river - - -	201	Brevilacqua anchorage, channel -	139
Arsa canal or gulf - - -	117	Briesta bay - - -	174
Artatore bay - - -	125	Brindisi port, road, light - - -	45
Aseo channel to Chioggia - - -	86	Brioni islands - - -	111
Asinello islet - - -	125	Brondolo port - - -	84
Aso river - - -	68	Brugnac bay - - -	154
Asola river - - -	69	Bua island - - -	163
Augusto or Lossin piccolo, port -	124	Buccari bay - - -	120
Avlona bay, town - - -	219	Budua port, anchorage - - -	214
Ausa river - - -	97	Busi island - - -	181
Bacili rocks near Bianche point light	144	Buso port - - -	97
—— rocks near Curzola channel -	190	Butrinto bay - - -	223
Bacchiglione river - - -	84	Caiola rock - - -	60
Badia port - - -	191	Calamota channel, island, anchorage	195, 198
Badisco port - - -	42		
Badò port - - -	117	Caleri port - - -	84
Bagnuoli rock - - -	111	Calvano river - - -	65
Barbaran islet - - -	108	Campi port - - -	56
Barbato channel - - -	131	Campomarino village, anchorage -	61, 62
Bari port, light - - -	50	Campora anchorage - - -	132
—— new port - - -	51	Candelaro river - - -	55
Barletta port, light, road - - -	53, 54	Canidole isleta, anchorage - - -	126

	Page		Page
Caorle town - - -	94	Cuciste road - - -	192
Capo Cesto port, rocks - -	159	Cuie port - - -	117
Capodistria town, bay - -	103	Currents - - -	14-23
Capri island, port - - -	155	Curvabella islet - - -	146
Carapella river - - -	54	Curzola island, anchorage, &c. -	187, 190
Carboni port - - -	188		
Carlopago port - - -	141	Daila port - - -	106
Carober port in Solta island -	167	Dalmatian coast - - -	28
—— port in Lissa island -	181	Diaplo islet - - -	228
Cassion port - - -	129	Dobrigno bay - - -	130
Castel St. Stefano town, anchorage -	215	Dolfin rock, off Pago island -	138
Castelli bay - - -	165	Dolin island - - -	131
Castello port in Medolino gulf -	115	Domboch port - - -	145
Castello di mare islet off Brindisi -	46	Dragacci bay in Sansego isle -	127
Castel Mpschio bay - - -	129	Drino gulf, river - - -	216, 217
Castro port - - -	42	Ducathes bay - - -	219
Catena islet - - -	145	Due Sorelle rocks - - -	145
Cattaro gulf, light - - -	207, 208	Duino port - - -	99
—— outer basin of - - -	208	Dulcigno road, town - - -	215
—— western ditto - - -	209, 210	Durazzo bay, anchorage, town, light	217
—— middle ditto - - -	210		
—— eastern ditto - - -	211, 212	Epirus - - -	223
Cattolica village, anchorage - -	75	Esino river - - -	72
Cazza islet - - -	183	Eso island, anchorage - - -	148
Cazza and Lagosta channel - -	29		
Cazziola islet - - -	183	Falconera road, port - - -	94
Cervera port - - -	107	Fano port, light - - -	74
Cervia port, light - - -	77	—— island - - -	128
Cesano river - - -	74	Fasana harbour - - -	111
Cesenatico port, light - - -	77	Feldrino river - - -	63
Cettina river - - -	169	Fermo town, anchorage - - -	68
Cherso island, bay, port - - -	121	Fianona port - - -	118
Chiave port - - -	184	Fiumara river - - -	119
Chiavlina anchorage - - -	129	Fiume, route to - - -	35
Chienti river - - -	68	—— road, light - - -	119
Chioggia port, anchorage - - -	85	Foglia river - - -	75
Cigale port - - -	125	Fontane port - - -	109
Cittanova port - - -	106	Fortore river, anchorage - - -	61
Città Vecchia port - - -	175	Fossone port - - -	84
Civitanova village, anchorage - -	68	Francavilla village - - -	95, 97
Civran shoal off Salturel point -	107	Friuli bay - - -	95, 97
Comacchio town, lake - - -	79, 80		
Comisa bay - - -	180	Gayo port - - -	230
Conca river - - -	75	Galiola isle - - -	127
Conero anchorage - - -	69	Gargano head - - -	56
Contarina town - - -	83	Germinack rocks - - -	145
Corfu island, road, citadel, light	222, 226	Giovenazzo anchorage, town -	52
—— channels - - -	231, 234	Giupana island - - -	196
—— making the land - - -	26	Giuseppe port - - -	171
Corno river - - -	97	Gliubaz strait - - -	142
Corsini port, light - - -	78, 79	Gnocca road, port - - -	82
Cortellazzo bank, port, anchorage	90, 93	Golo islet, anchorage - - -	131
		Gomena cape - - -	174

	Page		Page
Gomenizza bay - - -	223	Lesina island, port -	174, 176
Goro road, port - - -	80, 81	—— channel - - -	178
Gradas port, in Arsa canal -	118	—— canale da greco da -	179
Grado lagoons - - -	94	—— lake - - -	61
—— port - - -	98	Lete river - - -	68
Gran Sasso d'Italia - - -	64	Levante port - - -	84
Gravosa port - - -	201	Lido port, light - - -	90, 9
Greco port - - -	56	Lignano port - - -	95
Grignano bay, point - - -	99	Linguetta cape - - -	27, 219, 220
Grossa or Lunga island, light, anchor- age - - -	144	Lissa island - - -	179
Grossa point, bay - - -	103	Livenza river - - -	93
Grottamare village, anchorage -	67	Lossini island - - -	123
Hismo river - - -	217	Lossin Grande port, anchorage -	123
Ippo - - -	224	—— Piccolo or Augusto - -	124
Islands - - -	5	Luche bay - - -	172
Incoronata island, anchorage -	146	Lucize port - - -	171
Isola peninsula, cove, village -	104	Lucizza port - - -	129
Isonzato river - - -	98	Luka bay - - -	146
Isonzo river - - -	98	—— port - - -	192
Isto island - - -	134	Lunga or Grossa island, light, &c. -	143
Istria, west coast, anchorage -	102	Lungo port in Lunga island -	144
—— east coast - - -	116	—— port in Arsa canal - -	118
Jablanaz port - - -	141	—— port of Istria - - -	118
Jaklian island - - -	196	—— port in Unie island - -	126
Kakan island - - -	154	Macarsca port - - -	170
Kalikhipulo - - -	227	Macina shoal - - -	168
Kastrades - - -	226	Madonna channel to Chioggia -	86
Kerka river - - -	158	—— shoal, light (Paxo island)-	230
Klek bay - - -	174	Maestra point, port - - -	83
Knesa anchorage - - -	190	Magrisina islet - - -	137
Kovaia river - - -	218	Malamocco port, light, island -	87, 88, 89
Kondolonisi - - -	226	Malfi port - - -	200
Krido, Cape - - -	233	—— river - - -	216
Lacroma island - - -	203	Malinska bay - - -	129
Ladro port - - -	196	Maltempo channel - - -	140
Laghi cape - - -	218, 219	Mandoler port - - -	162
Lagagn rock off Pago island -	138	Manego port - - -	181
Lago Grande and Piccolo ports -	185, 186	Manfredonia gulf - - -	38
Lagosta island - - -	184	—— port, road - - -	55
—— channel - - -	29, 193	Maon island anchorage, Scardizza and Maon channel - - -	138
Lagostini rocks - - -	186	Marano village - - -	67
Laka port, light - - -	229	Marciara islet - - -	184
Langin port - - -	149	Marecchia river - - -	76
Lavoro spit, Brindisi - - -	47	Marino, port of Istria - - -	118
Lefkhimo, light vessel - - -	227	Martinskizza port - - -	120
Lemo channel - - -	109	Masliniza strait - - -	142
		Medolino gulf, port - - -	115
		Melada or Zara island - - -	135
		—— Sette Bocche or passage be- tween Grossa and - - -	531

	Page		Page
Mele river - - -	79	Mount Giove, Fano port - -	74
Meleda channel, island -	193, 194	— Gradara, near Pesaro -	75
Merlera point - - -	115	— Grado, Meleda island -	194
— island, anchorage -	128	— Hum, Curzola island -	187
Metauro river - - -	74	— Hum, Lissa island -	179
Mezza Sacca anchorage -	92	— Luro, near Pesaro -	76
— Meleda port - - -	195	— Maiella, near Ortona -	64
Mezzo channel - - -	147	— Marian, near Spalatro -	165, 166
— island, anchorage -	197	— Mavronoros, Albania -	224
Mileto point - - -	61	— Mezzo, near Pesaro -	75, 76
Milnà port - - -	171	— Mogorone, Pirano -	104
Miramar, palace - - -	101	— Montagnola, near Ancona -	73
Misa river - - -	73	— Moyar, near Planca point -	161
Mola port, light - - -	50	— Novillara, near Fano port -	74
Molfetta port, light -	52	— Opat, Incoronata island -	146
Molonta Grande and Piccolo ports -	205	— Osero, Lossini island -	123
Monopoli port, light -	49	— Ostrine, Nera point -	118
Monte St ^a Croce, Trieste -	101	— Pagano, near Pescara -	65
— Santo castle, village, anchorage	68	— Pegola, Albanian coast -	220
Montone river - - -	78	— Petkà, near Calamota channel	198
Morlacca channel - - -	35, 140	— St. Angelo, Mount Gargano -	2, 56
Morter island, channel, anchorage -	153	— St. Elia, near Molonta ports -	206
Mount 'Agioi Déka, Corfu island -	227	— near Traste bay -	213
— Ardizza, near Pesaro -	72, 75	— Calamota channel -	197
— Barcaglione, near Ancona -	73	— St. Giorgio, Lagosta island -	184
— Biocovo, near Macarsca -	170	— Corfu island -	224
— Bol, Zuri island -	153	— St. Marino, near Rimino -	76
— Borac, near Almissa -	220	— St. Nicolò, Lesina island -	174
— Caldero, or Maggiore, Istria, 32,	110	— St. Salvatore, Corfu island -	224
— Calvario, Lossini island -	123	— near Budua -	214
— Calvo, Mount Gargano -	56	— St. Vito, Brazza island -	171
— Carpegna, near Rimino -	76	— Sasso Simone, near Rimino -	76
— Cassone, Cattaro gulf -	208	— Schah, Ugliano island -	149
— Catria, near Fano port -	74	— Sella, Cattaro gulf -	208
— Cica, Albanian coast -	220	— Sibilla, near Grottamare -	68
— Cicara, Albania -	220	— Sorigno, Arbe island -	132
— Cis, Cherso island -	121	— Strazza, Solta island -	166
— Conero, Ancona -	2, 69	— Tmor, near Calamota -	202
— Corno or Gran Sasso -	2, 64	— Velagora, Traste bay -	213
— Czarovich, Sabbioncello -	192	— Vela Strasa, Lunga island -	144
— Desviglie, Cattaro gulf -	211	— Vipere, Sabbioncello -	192
— Dubiuka, near Pasman strait	151	— Vlasca, near Bua island -	164
— Duboviza, Albanian coast -	207	— Zerceberdo, Curzola island	187
— Euganei, near Venice -	89	Muia or Muggia bay - - -	103
— Falconara - - -	73	Murto bay - - -	224
— Falcone, Cattaro gulf -	208	Musone river - - -	173
— Fano, near Fano port -	74		
— Fiorenzuola, near Pesaro -	75, 76	Narenta channel, river - -	173
— Gabicce, near Pesaro -	75	Navigation of the Adriatic -	25-40
— Gargano, Manfredonia gulf -	2, 56	Nera point - - -	118
— Gelinach, near Zirone island	162	Nona bay - - -	140

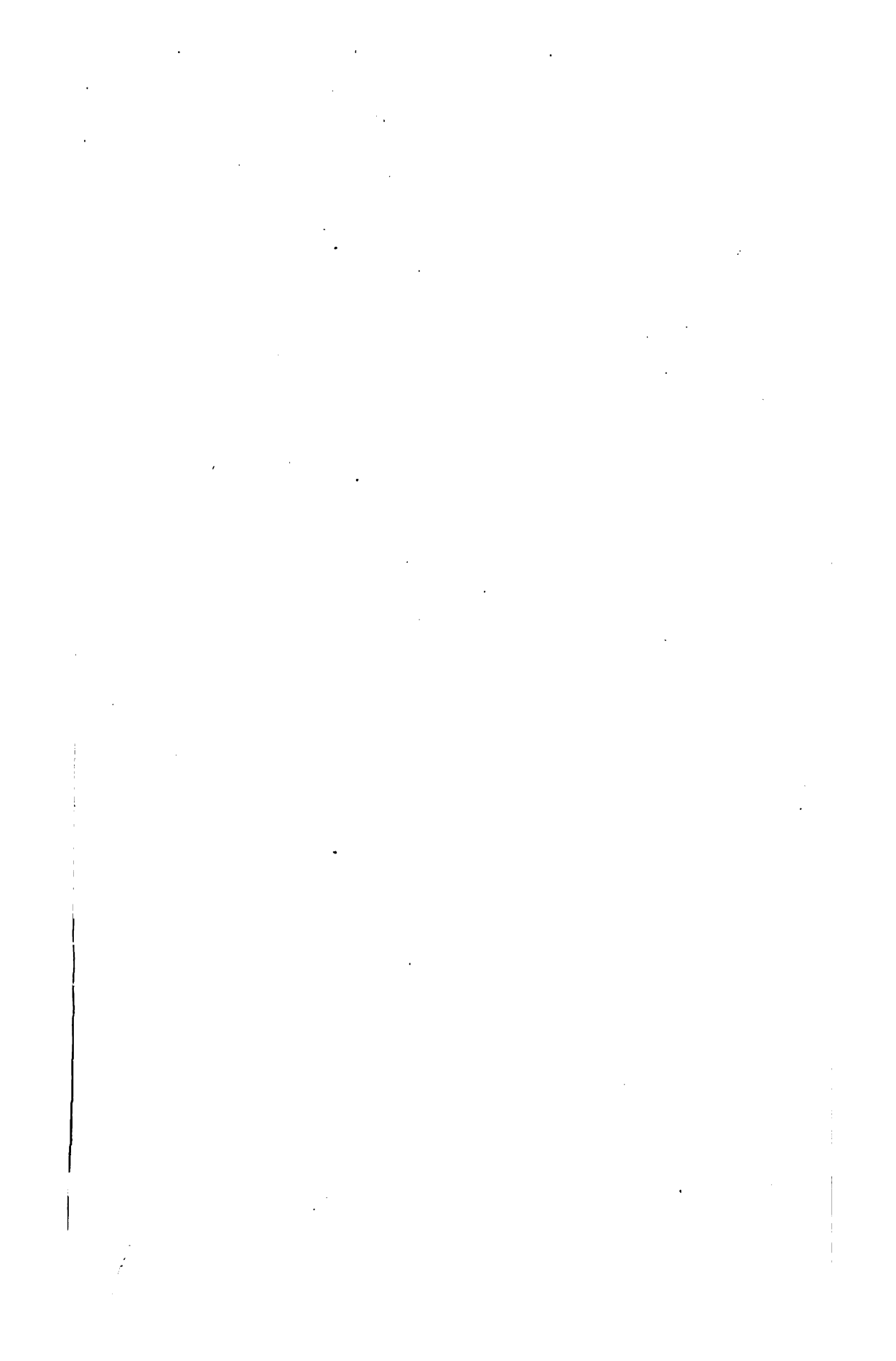
	Page		Page
Northward, route to the	31	Pirano port, road	104
Novigradi lake, town	142	Plakka islet, Antipaxo	231
		—— point, Corfu	228
Obravacina	145	Planca point	161
Ofanto river	54	—— islands, &c., eastward of	28
Olipa island	196	Planchetta rock	190
Oliveto port in Solta island	167	Plataria bay	224
—— port in Brazza island	171	Po river	83
Olmo Grande and Piccolo ports	114	Po di Goro port, road	80, 81
Omago port	105	Poco Pesce channel to Chioggia	86
—— in Arbe island	132	Pogliana Nuova port, channel	138, 40
Ombra bay	200	Pola port, road, light	112
Orsera bay, castle, rocks	109	Polignano port	50
Orso anchorage	45	Pomer port, in Medolino gulf	115
Ortona port	63	Pomo rock	182
Osero channel, town	122	Pomposa town	83
Otranto cape, port	43	Porto Grande, Torcola island	178
		Porto Nuovo, Mount Conero	69
Pago island, port	137	Porto Re, Quarnero	120
—— channel	35, 138	Potenza river	69
Palazzo port	194	Pouille coast	40
Palermo bay, town	221	Poveglia village	90
Pali cape	217	Pozzattini port	84
Palma port	194	Premuda island, anchorage	133
Parenzo port	108	Primaro port	79
Parvicchio island	130	Primero port	98
Pasman island	149	Priluka port	119
—— strait	34, 150	Promontore point, light	33, 114
Passages, on making	25-40	Provicchio island, anchorage	156
Paxo island	229	Punta Croce channel, point	122
Pedaso village, on Aso river, anchorage	68	Puntadura island, anchorage, road	139
Pelagosa isles	60	Quaranta bay	222
Pelazza bay	82	Quarnero gulf	34, 116
Peles port	160	—— grand channel	34, 127
Pelestrina, channel to Chioggia, island	86, 87	Quarnerolo channel, rocks	35, 133
Pelorosso road	90	Quieto port, river	106
Penna point	63		
Pericolosa, shoal near Promontore	114	Rabaz port	118
Pernata point	121	Raciskie port	189
Pesaro port, light, anchorage	75	Ravenna town	78
Pescara port, river, anchorage	64	Ragusa port, road	202
Peschici village	57	—— Vecchia port	204
Pettacciato bank, anchorage	62	Rasanzi rocks, in Morlacca channel	142
Petagne rocks, Brindisi	46	Recanati village, anchorage	69
Pettini rocks, near Selve island	136	Rimino port, light	76
—— rocks, near Ragusa Vecchia	204	Risano river	104
Pianosa isle	59	Rochetta channel, to Malamocco	88
Piave, Sacca di, anchorage	92	Rodi town, anchorage	57, 58
—— Vecchia, port, light, river	92, 93	Rodoni cape	217
Pilignino rock	216	Rogosnizza port	160
Piomba river	65	Bonzi port, in Medolino gulf	115

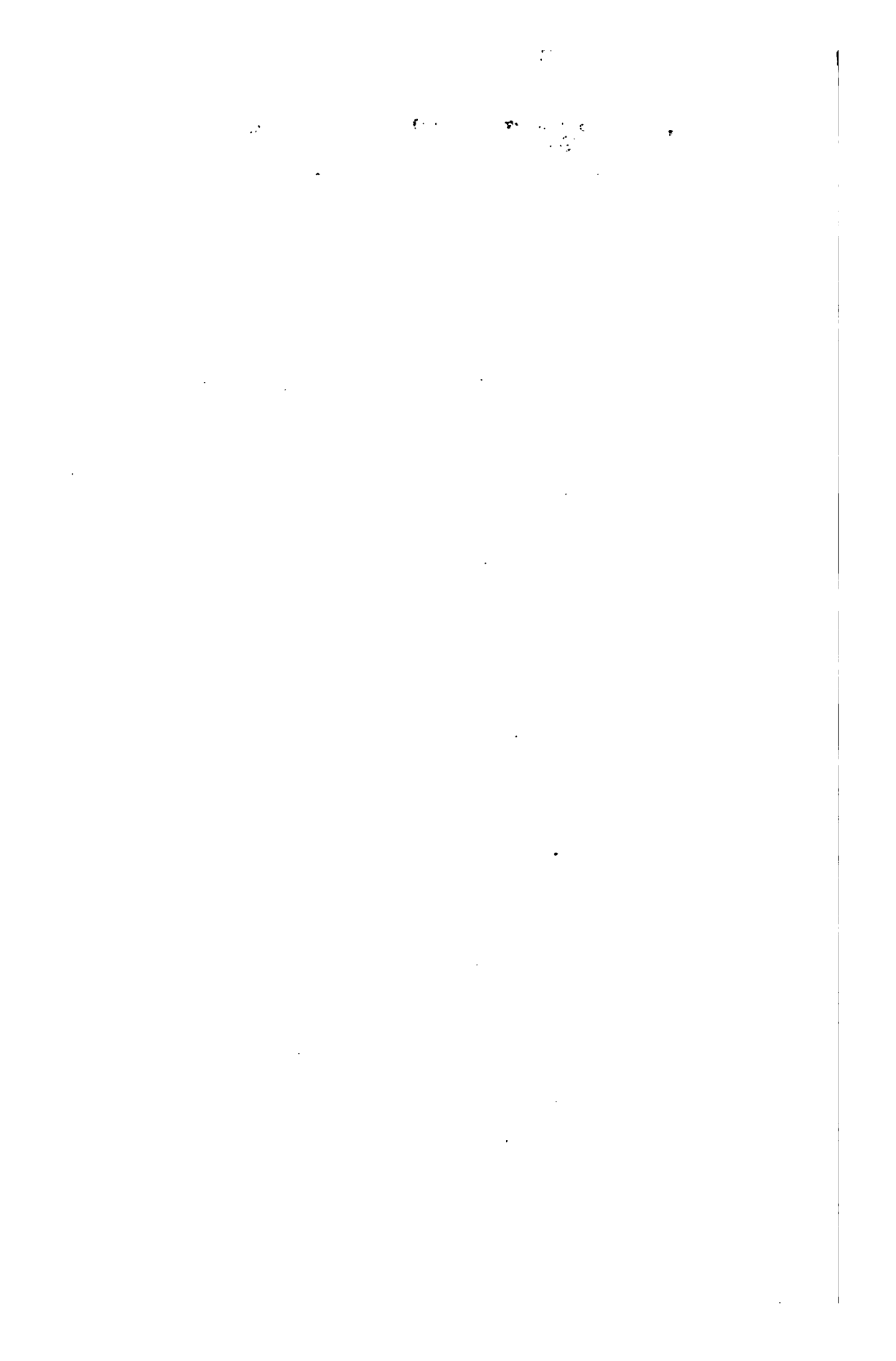
	Page		Page
Rosario road - - - - -	192	Sangro river - - - - -	63
Rose port, in Pirano road - -	105	Sansego isle, anchorage - -	126
Rosso port, in Medolino gulf -	115	Saracino point - - - - -	154
———, in Lagosta island, light -	184	Saseno island - - - - -	219
Rovigno port, light - - - - -	110	Sassobianco bay - - - - -	129
Sabbioncello peninsula - - - -	192	Savio river - - - - -	78
Saccione river - - - - -	62	Scala shoal, near Craul point -	44
Santi Quaranta bay - - - - -	222	Scarda island - - - - -	134
St. Andrea islet - - - - -	181	Scardizza island - - - - -	138
——— port - - - - -	96	Scipan bay, port - - - - -	197
St. Arcangelo rock, anchorage	161, 162	Scirocco wind - - - - -	9
St. Benedetto village - - - - -	66	Scutari city, lake - - - - -	216
St. Cataldo anchorage, off Lecce -	45	Sdobba port, point - - - - -	98
——— point, off Bari - - - - -	52	Sdrelaz port - - - - -	149
St. Clemente rocks - - - - -	70	Sebenico channel, port - - -	33, 157
St. Croce port, Venetian coast -	93	Sebenico Vecchio port - - -	159
——— or Gravosa port - - - - -	201	Secca del Gobbo, shoal - - -	105
St. Elpidio village, anchorage -	68	Segna port - - - - -	140
St. Erasmo island, port - - - -	91	Segna bocca, or channel - -	35, 130
St. Eufemia anchorage, in Arbe island	131	Selve island, road - - - - -	136
——— in Bua island - - - - -	163	Semene river - - - - -	218
St. Gennaro anchorage - - - - -	45	Serpa rock - - - - -	228, 232
St. Giorgio port, in Lissa island -	179	Sestrugn island - - - - -	148
——— in Lesina island - - - - -	176	Sette Bocche - - - - -	135
St. Gregorio islet, anchorage -	131	Sile river - - - - -	92
St. Marco islet, anchorage - - -	130	Simone port - - - - -	138
St. Margarita port - - - - -	94	Sinigaglia port, light - - -	73
St. Maria di Leuca cape, anchorage	41	Sipar shoal - - - - -	105
——— making the land of		Sirolo village, anchorage - -	69
cape - - - - -	26	Sistiana bay - - - - -	99
St. Martino port, in Cherso island -	122	Slano port - - - - -	199
——— anchorage at Brazza		Sloselle bay - - - - -	151
island - - - - -	171	Smajan island - - - - -	145
——— bay, in Calamota chan-		Soline port - - - - -	149
nel - - - - -	202	Solta island, channel - - -	166, 167
St. Nicolò port, in Morter island -	153	Sordo port - - - - -	167
——— islet, near Parenza - - -	108	Sotto Marina channel to Chioggia -	86
——— at Budua - - - - -	214	Spalatro port - - - - -	166
St. Pietro anchorage, at Arbe island	132	——— strait - - - - -	168
St. Pietro di Nembo islet, port -	125	——— channel - - - - -	30, 168
St. Stefano port, in Brazza island -	170	Spalmadore islets - - - - -	176
——— river - - - - -	217	Stagno channel, anchorage -	199
——— village, Corfu - - - - -	225	Stella river - - - - -	95
Saldon bay - - - - -	164	Stipana bay - - - - -	130
Salino Maggiore river - - - - -	65	Strade Bianche, sea-mark near Aulona	220
Salona village - - - - -	165	Strugnano point - - - - -	104
Salpi lake - - - - -	54	Stupizza bay - - - - -	154
Salvore cape, light on Bassania point	105	Sybota rocks, Albania - - -	223
——— shoal off - - - - -	105	Tagliamento port, river - -	95
Samotraki island - - - - -	229	Tajer port - - - - -	144

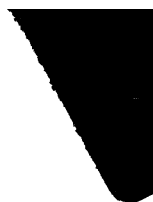
	Page		Page
Tenna river - - -	68	Varano, lake - - -	61
Termoli anchorage, town - -	62	Vasto town, anchorage - - -	63
Testenich anchorage - - -	145	Vattuzza port - - -	223
Testenich port - - -	193	Veglia island, bay, port - -	128
Theresian-stadt, Trieste - -	101	Venetian coast - - -	37, 85
Tides - - -	23	Venice city - - -	88
Tignoso light, Corfu - - -	231	—— tides - - -	22
Timavo port, river - - -	99	Verbosca port - - -	175
Timone port - - -	128	Vergada island - - -	151
Tonara bay - - -	151	Veruda port - - -	113
Tornuza point - - -	124	Viesti port - - -	57
Torcola island, channel - -	178	Vignole bay - - -	117
Tordino river - - -	65	Villanova port - - -	49
Traste bay - - -	213	Vodizze road, village - - -	156
Trani port - - -	53	Voizua river - - -	218
Trau channel, port - - -	164	Volano port - - -	80
Trau Vecchio bay - - -	161	Volpe rock and beacon - -	70, 73
Tremiti islands, port, anchorage	38, 58, 59	Vomano river - - -	65
Tre Porti port, anchorage Venetian			
coast - - -	92	Winds - - -	6-14
—— anchorage at Curzola island	188		
—— cape - - -	219	Xernovizza bay, river - -	168
Tre Pozzi port - - -	189		
Tre Scogli - - -	222	Yliapades bay - - -	228
Trieste, route to - - -	36		
—— to Venice from - - -	38	Zermagna river - - -	141
—— gulf, port, light - -	99, 101	Zappontello passage - - -	135
—— arsenal - - -	100	Zara channel, port, anchorage	33, 151, 152
Trigno river - - -	62	Zara Vecchia town - - -	151
Triluke bay - - -	150	Zecevo point - - -	160
Trontino river - - -	65	Zirona Grande and Piccola islands	162
Tronto river - - -	65	Zirone channel - - -	162
		Zit island - - -	148
Ugliano island - - -	149	Zlarina island - - -	155
Ulbo island, road - - -	136	Zorzi or Ulysse rock - - -	227
Ulissee rock - - -	227, 229	Zabudaski rock - - -	124
Umana village - - -	69	Zaglava village - - -	145
Unie island, bay, channel - -	125, 126	Zuane - - -	230
		Zuri island, port - - -	153, 154
Val shoal - - -	106	Zut island - - -	148
Valle Grande bay - - -	187		

LONDON:

Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
 Printers to the Queen's most Excellent Majesty.
 For Her Majesty's Stationery Office.







2000



